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THE METALLURGICAL MOTHER GOOSE.—III.

There was a lot of mines;
And within the "side-lines"
The mineral was full of lead, lead, lead;
So they built a lot of stacks,
And they toted up the sacks,
And dumped 'em at the tunnel-head, head, head.

LEADVILLE, June 2, 1879. *

CORRECTION.

We have received from Dr. RAYMOND, in Leadville, Colorado, an indignant letter concerning a typographical error in the verses addressed to Mr. HOLLEY, printed by us on the 24th of May. It seems that the word printed "overcome," in the second line, should be "overrun," thus giving a perfect rhyme. We are willing to make the correction, but not to accept the blame. If Dr. RAYMOND drops into poetry in our columns, he must do so at his own risk. We can't afford to maintain a special bard to read his proofs; and he shouldn't rush off to Colorado, leaving work of such enormous importance and minute delicacy to inexperienced hands.

CLAYTON'S LAW.

We publish elsewhere a letter from Mr. J. E. CLAYTON, in reply to our article of May 31, criticising his announcement before the Bullion Club of a relation, observed and published by him twenty-three years ago, between the pitch of ore-chimneys in fissure-veins and the lines of movement on the walls of such veins. In that article we expressed with perfect respect our dissent from Mr. CLAYTON'S opinion. It is unfortunate that he can not discuss a question so completely removed from personal considerations without losing both his temper and his manners, charging his critic with self-sufficiency, and pronouncing the most innocent phraseology to be offensive and uncalled-for. We spoke of the alleged relation observed by Mr. CLAYTON as "CLAYTON'S law," a term which our esteemed correspondent could not deem insulting, if he clearly comprehended the meaning of the words. That he lacks this comprehension, is evinced by his vehement disclaimer of the discovery of a law, coupled with his positive claim to the discovery of "the fact that the direction of the movement of the walls of the fissure upon each other, at the time it was formed, is coincident in direction with the rich chimneys of ore in their downward trend," etc. This he distinctly declares to have been new to the profession and to science. But this is nothing more nor less than the assertion of a law. Mr. CLAYTON is like the man who was talking prose, and didn't know it. He ought to be proud of his unconscious achievement, not angry with those who recognize it.

If this law, or observed relation, really exists, Mr. CLAYTON undoubtedly, so far as we know, deserves the credit of its discovery and promulgation. We heard it from his lips many years ago, and presume he will remember that we have personally expressed to him our doubt of its foundation in facts or reason. When he uttered it as a well-established and admitted proposition before an unprofessional audience, which could not be expected to distinguish between what was settled and what was still controverted in the science of vein-phenomena, we took occasion to "pitch into," as Mr. CLAYTON elegantly says, not the person from whom we differed, but the assertion that the law he asserted was "now a pretty well-established fact." If Mr. CLAYTON thinks the physical facts from which he deduces his law "are not seriously questioned by any intelligent" mining engineer, it is high time that he realized the contrary; and he should welcome controversy on the subject, as likely to elicit the truth. We may claim an acquaintance with the mining engineers of the country at least equal to Mr. CLAYTON'S; and we have spent a good many years in the study of its mineral deposits, and in making ourselves acquainted with the literature of the subject at home and abroad. We have yet to find the educated engineer who admits the correctness of Mr. CLAYTON'S proposition, or the text-book or essay or address, not produced by Mr. CLAYTON, which indorses it. And our own observation, so far as it goes, and that of others with whom we have conversed, fails to show the existence of such a law as he supposes to exist. Nobody doubts the sincerity of Mr. CLAYTON'S convictions, or that he has "the courage" of them, whatever that may be; but his apparent notion that sincerity prevents mistake or forbids criticism, and that respectful dissent is reckless personal attack, is too childish even for serious rebuke. It is not "characteristic" of Mr. CLAYTON, and he could not have been betrayed into it if he had understood the meaning of our language. But his momentary wrath at an imaginary offense has blinded him both to the spirit of our argument, and to the argument itself.

Mr. CLAYTON now qualifies the statement of his address, saying that he referred to lines of movement taking place at the time of the formation of the fissure; and remarks that the expert ought to be able to distinguish between these original markings made by the walls on each other, and subsequent ones, as easily as between the marks of a land-slide and those made by the dragging of a saw-log. We should be glad of some further light on this point. It certainly seems to us that if only a very small surface were exposed, the marks of a land-slide and a saw-log might be somewhat alike; and as Mr. CLAYTON offers his law as a means of determining certain facts in advance of deep explorations, there must be, in his judgment, a distinct difference between the effects of earlier and later motion and friction on the vein-walls. It is a pity that time did not permit him to contribute something on this point to the general knowledge.

But accepting his statement that the motions of the walls before the fissure was filled can be traced without extensive explorations, by their striæ alone and in spite of all later markings, we are met by his surprising theory, that the lines of movement on the walls of fissures are produced by the forces that produced the fissures, and that the same forces "put into action the chemical forces that filled the fissures with gangue-stone and ore." Hence he concludes that the downward trend of the ore-channels, in seeking their source, must be parallel with the lines of movement so caused.

Now, the principal force which has produced the earliest striations on the walls of fissures is simply gravity. SCHMIDT'S law of faults (we intend no insult to SCHMIDT!) is a direct consequence of this theory, and has been abundantly tested in practice. The strain producing a fissure is rarely, if ever, a shearing strain, but a transverse bending strain, under which the rocks part. Their sliding on each other is the effect of gravity, readjusting their positions after the breaking strain has been removed. And the direction of such movement is dependent upon the shape and hardness of the surfaces and points which are brought into contact, and which prevent the perfect closing of the fissure. The great geological faults are not usually mineral veins; and the causes which have produced them (continental elevation, side-pressure, etc.) are too wide-spread to be connected with the angles exhibited by scratches on a few feet of exposed surface in a mineral vein. Even in these great breaks, it is highly probable that gravity has caused the final movements which mark the planes of contact.

Still less tenable is the notion that the "chemical forces" have been

"put into action" by the "deep-lying causes" so as to follow certain lines. This vague generality means nothiug, unless it means that solutions and vapors have been prevented from distributing themselves equally through the fissure by the causes that made the fissure. This we do not believe. The causes which determine the deposition and distribution of mineral in fissures are connected with the temperature, specific heat, conductivity, and texture of the wall-rocks, the width of the fissure, and the relations of successive infiltrations. Moreover, for large numbers of veins, the final distribution of the ore is due to the dissolving and redistributing effect of percolating surface waters.

Mr. CLAYTON'S theory amounts to nothing, as a reinforcement of his alleged facts. It is, indeed, when critically examined, an argument against them. But we do not reject the observations on account of the weakness of the theory. On the contrary, if the facts could be established, there would be little difficulty in giving them a much more reasonable explanation. We do, however, sincerely, humbly, but thoroughly, doubt the adequacy of the observations themselves to establish any general law. We should be glad to hear from mining engineers on the point; and if, as Mr. CLAYTON thinks, it is pretty well-established, there ought to be no difficulty in getting evidence to support it.

As to Mr. CLAYTON'S analysis of our article, and his amusing blunder as to its meaning, we need say little. We did not assert that his law was applied by him to other than fissure-veins; we did not distort his meaning at all; but we showed that the only cases in which the phenomena to which he referred were likely to occur were such as he now says he did not mean. Nor did we attack him personally in any way, or belie the esteem with which we regard him—an esteem which restrained us then, and restrains us now, from characterizing more strongly the presentation to a popular audience, as established science, of crude and controverted individual opinions.

WE are pleased to see the position the *Tribune* has taken in mining matters, and to know that, with such careful and intelligent correspondents as Mr. Z. L. WHITE, estimates of a production of $100,000,000 by Leadville this year will cease. The Eastern daily press has delayed, as long as possible, opening its columns to giving important information on this large and rapidly-developing industry; but now it is receiving so much attention that no newspaper will be complete without a liberal amount of information on this subject.

BOOKS RECEIVED.

Treasury Department. Annual Statements of the Chief of the Bureau of Statistics on the Commerce and Navigation of the United States for the Year ended June 30, 1878. Part II. Foreign Commerce. Washington: Government Printing Office. 1879. 8vo, pages 949. (*No Index.*)

Fractical Chemistry. A Manual for Use in Technical Colleges or Schools and for Manufacturers, etc. Based upon a Translation (partly by Dr. T. D. Barry) of Stohmann & Engler's German Edition of Payen's "Précis de Chimie Industrielle." Edited throughout and Supplemented with Chapters on the Chemistry of the Metals, etc. By B. H. Paul, Ph.D. Illustrated with 698 Engravings on Wood. New York: John Wiley & Sons. 1878. 8vo, pages 987. (Price, $10.)

Graphics for Engineers, Architects, and Builders. A Manual for Designers, and a Text-Book for Scientific Schools. Trusses and Arches Analyzed and Discussed by Graphical Methods. By Charles E Greene, A.M., Professor of Civil Engineering, University of Michigan. In Three Parts.....Part II. Bridge-Trusses. Ten Folding Plates. New York: John Wiley & Sons. 1879. 8vo, pages 177. (*No Index.*)

Thirty-Seventh Annual Report of the Board of Education of the City and County of New York, for the Official Year ending December 31, 1878. New York: Hall of the Board of Education. 1879. 8vo, pages 419.

An Outline of General Geology, with Copious References. Designed for the Use of both General and Special Students. By Theo. B. Comstock, B.Ag., B.S. Ithaca, 1878. 8vo, pages 82, interleaved. (*No Contents or Index.*)

Treatise Relative to the Testing of Water-Wheels and Machinery, with Various other Matters Pertaining to Hydraulics. By James Emerson. Second Edition. Springfield, Mass. 1878. 8vo, pages 216. (*Properly, no Index.*)

Graphical Computing-Table. (Chart, 23×28½ inches.) Graphical Computing-Table. By William H. Bixby, Lieutenant of Engineers, United States Army. New York: John Wiley & Sons. 1879. Sq. 16mo, pages 29.

A Practical Treatise on China Painting in America, with Some Suggestions as to Decorative Art. By Camille Piton. With Folio Album of Plates. New York: John Wiley & Sons. 1878. (The Text) Sq. 16mo, pages 69. (*No Index.*) (Price, $1.50.)

A Manual for Engineers and Steam Users. With Tables of the Performance of the Harris-Corliss Engine, Duty of Pumping-Engines, Economy of Boilers and Furnaces, Steam-Boiler Explosions, Strength of Materials, Mensuration, etc. By John W. Hill, Mechanical Engineer. Providence: William A. Harris. [1878.] 16mo, pages 109.

AMERICAN HEALTH PRIMERS. *Hearing, and How to Keep it.* By Charles H. Burnett, M.D. Philadelphia: Lindsay & Blakiston. 1879. 16mo, pages 152. (Price, 50 cents.)—*Long Life, and How to Reach it.* By Joseph G. Richardson, M.D. Philadelphia: Lindsay & Blakiston. 1879. 16mo, pages 160. (Price, 50 cents.)

Report of the Auditor General of the Finances of the Commonwealth of Pennsylvania, for the Year ending November 30, 1878. Harrisburg: Lane S. Hart, State Printer. 1879. 8vo, pages 224.

MESSRS. JAMES LEFFEL & Co., of Springfield, Ohio, write us as follows: "We are fully established in our new works, and are running to the utmost capacity to fill orders for our Leffel wheels and small engines."

THE Manchester Locomotive Works are quite busy, and report sales of steam and fire engines to Randolph and Brockton, Mass., Portsmouth, N. H., and 2 to Oregon, and a self-propeller to Hartford, Conn.

CHIMNEYS AND STRIATIONS.

In the ENGINEERING AND MINING JOURNAL of May 3d, 1879, Dr. Raymond takes exception to some remarks made by me before the Bullion Club, in reference to ore-chutes or chimneys, and the methods of ascertaining their direction or downward trend, in advance of deep explorations.

The object of the address was to point out some of the most important methods of examining mining properties for large operations, in order to reduce the *risks* to the narrowest possible limits. In the course of my remarks I called especial attention to the importance of ascertaining the position and extent of the ore-chutes or chimneys on the line of outcrop, the distance between them, and the pitch or downward trend of the chimneys in the plane of the lode.

I stated then, substantially, and repeat it now, that the direction of the downward pitch of the chimney of ore in the lode can be ascertained in advance of deep explorations by a careful study of the country rock, the structure of the lode, and the lines of movement shown on the walls of true veins.

While this statement was short and perhaps incomplete, and applied only to true fissure-veins, it was broad enough to cover the class of lodes referred to. It would require more time and labor to discuss this subject in all its bearings than I have at my command, even if I felt so inclined, which I do not.

My "colleagues" in the profession know that I have the courage of my convictions, and don't hesitate to express them on proper occasions; but neither my colleagues nor any one else outside of the profession ever heard me set up a claim that "striations" were present on the walls of all ore-deposits, or that it was the only guide that marks the downward trend of ore-chimneys.

The "profession" knows, or ought to know, that "true fissures" have been made in the crystalline rocks by mechanical movements of the rock formations, and that a "true fissure" is also a line of "fault" or displacement, one side having been raised or the other depressed. This movement of the walls of the fissure has been made in certain definite lines having some relation to the center of disturbance in the district where they are found.

Now, then, how are we to ascertain the direction of such movement? My answer is, by a careful study of the geological disturbances of the country rock along the fissure-lines of the district, the structure of the lodes in the fissures, and the grooves or striations on the walls of the fissures.

There is nothing new in this to any good mining geologist. All that I ever claimed as new to the profession and to science, in this connection, was the fact that the direction of the movement of the walls of the fissure upon each other *at the time it was formed*, was coincident in direction with the rich chimneys of ore in their downward trend to the deep, and that the "striation" on the walls of the fissure was one of the markings made by such movement, and in most cases was an unmistakable evidence of the direction of the displacement.

So far as I am aware, these physical facts are not seriously questioned by any intelligent member of the "profession." But if I understand Dr. Raymond aright, he doubts the fact (as stated by me) that the chimneys, or ore-chutes, *are*, as a rule, coincident in direction with the line of force and movement that produced the fissure.

I have no doubt about the truth of what I have stated. My convictions are the result of long and patient research. My opportunities have been good for observing and studying the facts and comparing their relations to each other; and my conclusions are, that the deep-lying causes or forces that produced the fissures, and gave direction to the movements of the walls upon each other, also put into action the chemical forces that filled the fissures with gangue-stone and ore, and hence the line of movement and line of deposit both point to a common source, and are, in most part, coincident in direction.

The ore-chimneys may divide and, for a time, pitch in opposite directions, and then come together again lower down and separate again, so as to "disregard striations with glorious recklessness" (my critic evidently regards "recklessness" as "glorious" in this connection). But the fact still remains that the general trend of the ore-chutes is toward their source, and their divergence from direct lines is attributable, in most part, to mechanical causes of a merely local character.

The shape and directions of ore-chutes in "beds" are to be determined by a proper study of the foldings and corrugations of the under- and overlying beds. It is a question of structure without regard to striations. But, even in such case, a careful observation of "striations" may help to determine another interesting question, as to whether the ore-chutes in the beds were deposited before or after the corrugations and plications were deposited. Striations that have been made *subsequently* to the filling of fissures may be made in a different direction, and may have been produced by causes different from that which produced and filled the fissure. The expert ought to be able to distinguish between the original markings made upon the walls of a fissure, and the subsequent movements that dislocate or crush a vein, as readily as he could between the marks made by a land-slide and those made by the dragging of a saw-log.

As all that I have said about "striations" has been in reference to "true fissure-veins," I can't quite see why Dr. Raymond should distort my meaning so as to make it appear that I apply the rule to *all* deposits of ore, including "beds" and "segregations," unless he enjoys the "glorious recklessness" of pitching into every one whose opinions happen to differ from his own. His remark about "Clayton's law" was uncalled-for and offensive.

The self-sufficiency of the concluding sentence of his criticism is characteristic. He says: "But, as we have sufficiently shown, the law has but a slender foundation, and can have but a precarious application." The Doctor has constructed a man of straw, that he calls "Clayton's law," and then, with "glorious recklessness," proceeds to demolish it.

I hope that I have "sufficiently shown" that my claim to the discovery of a law never had an existence except in the lively imagination of my critic. I find difficulty enough in reading well-known laws without inventing new ones on private account.

J. E. CLAYTON.

NEW YORK, May 5, 1879.

ON THE REMOVAL OF PHOSPHORUS AND SULPHUR DURING THE BESSEMER AND SIEMENS-MARTIN PROCESSES OF STEEL MANUFACTURE.*

By George J. Snelus, A.R.S.M., F.C.S., etc.

In speaking of the elimination of phosphorus during the puddling process, Dr. Percy, in his well-known work on iron and steel, suggests that probably the phosphorus is eliminated by a process of liquation of fluid phosphide of iron from the pasty puddled ball. It may be worth while to quote the exact words, which are as follows: "Hence it is clear that by the direct action of the oxygen of the air upon molten pig-iron, or even molten malleable iron, phosphorus is not eliminated in a sensible degree. To what, then, are we to ascribe the opposite result, which occurs in the process of puddling, in which there is a powerful oxidizing agency at work? Is it due to the effect of the liquid cinder? Although I can not answer these questions in a satisfactory manner, yet I will venture upon a conjecture which I have long regarded as at least plausible:

"In the puddling furnace, the iron, as it 'comes to nature,' separates in a semi-solid or somewhat pasty state, and is not molten, as it is in Bessemer's process, the temperature in the former case being much below that in the latter, in which intense heat is developed by the actual combustion of iron. Owing to the formation and persistency of these pasty lumps in the puddling furnace, which, when collected into balls, extend considerably above the surface of the bath of cinder, opportunity is afforded for the liquation or sweating out of any fusible compounds of iron such as phosphide; and it is in this manner that I conceive the removal of the phosphorus may in a great measure be effected."

Other writers upon the subject have added various causes to account for the remarkable fact that has been so long accepted as an axiom, that phosphorus could be almost perfectly removed by the puddling process, and not at all in the Bessemer converter; but I am not aware of any writer who, up to the time I made my statement at our London meeting last year, had publicly made known that the elimination of phosphorus in the pneumatic process depended entirely upon the basic nature of the slag.

I was led to doubt the correctness of Dr. Percy's hypothesis during my studies of the puddling and refinery processes at Dowlais, and when I came to study the reactions which occurred in the Danks process, the particulars of which were laid before this Institute, I was struck by the fact that a good deal of the phosphorus was eliminated while the iron was in a fluid state. I communicated this observation to Dr. Percy in March, 1872, and at the same time told him that I believed I had discovered why this occurred.

On comparing analyses of iron and slags at different stages during the processes of Welsh refining, puddling, and Bessemer converting, I had previously noticed that while the phosphorus was comparatively easily removed in puddling, variable but generally small amounts were removed in refining, and none at all in converting, even if the iron were considerably overblown. A comparison of the slags from the three processes showed that while that from the puddling process was highly basic, that from the refinery was less basic, and that from the converter highly siliceous. I also noticed that if a siliceous fettling were used in the puddling furnace, or a very siliceous pig-iron used, the resulting metal was inferior; and hence while at Dowlais I strove to get a non-siliceous pig for puddling and a non-siliceous ore for fettling, and strongly recommended for this purpose the Campanil ore from Somorostro. For similar reasons, when consulted some years ago by Mr. Jenkins, of Consett, about the difficulty then experienced in keeping his iron for plates free from red-shortness, I advised the use of a manganiferous ore moderately free from silica, which has, I believe, been used with success ever since.

It is a well-known fact that silica is a much stronger acid than phosphoric acid, and that it will displace the latter from combination at high temperatures, and consequently, unless the silica is thoroughly saturated, there will be no base for the phosphoric acid to combine with, and, therefore, in contact with metallic iron at high temperatures, it will be reduced as fast as made, if, indeed, the phosphorus is oxidized at all under these conditions. These considerations led me to believe that phosphorus was removed in all processes just in proportion to the basic nature of the slag.

Having these facts before me, early in 1872 I considered how I could obtain invariably a highly-basic slag in the Bessemer converter, and I saw clearly that to obtain this result it was absolutely necessary to line the vessel with a basic or neutral material, and that no success could be expected so long as it was lined with ganister or any material containing a large proportion of silica. Carbon occurred to me as an infusible neutral substance, suitable in so far as it would not affect injuriously any lime or other oxide that might be added to form a basic slag, but it had other serious drawbacks. Oxide of iron alone was too fusible to stand the intense temperature of the blow. While thinking over these things, I was fortunate enough to make the observation that certain kinds of lime, when submitted to very intense heat, became indurated and converted into a form in which they were no longer acted upon by water. The observation was made while performing the experiment recorded on page 249, vol. ii., of the "Institute Journal" for 1872. I had used a lime crucible for the experiment, which was to prove the power of free silicon to reduce oxide of iron. The crucible, imbedded in lime, was submitted to the most intense heat of the Siemens steel-melting furnace at Dowlais. After the experiment, I noticed that the lime crucible had turned brown, and was no longer alkaline to the taste, while at the same time it was quite hard and stony in character, and absolutely unaffected by water. It at once occurred to me that lime in some form or other was the material I was in search of for lining the converter. The well-known fact that it does not do to burn lime at too high a temperature if it is to be caustic, also occurred to me. This is known to be particularly the case with magnesian limestones. Hence I specified magnesian limestone particularly. From some experiments I made shortly afterward, I found that it was possible to make bricks out of lime or limestone, provided that when lime was used it was crushed, quickly compressed, and fired before it had time to absorb moisture; but it required intense temperature to consolidate them, particularly if the lime was very pure, while a small quantity of oxide of iron or other fusible base facilitated this. If lime was used, it was necessary to be well burnt first, otherwise, the material was not porous enough to allow the small quantity of carbonic acid to escape without breaking up the brick. Finding, however, that crushed limestone lent itself with considerable facility to such a purpose as lining a converter, being plastic and binding when moist—like clay, in fact—it occurred to me to use it in this form, and to fire the vessel at a very high temperature. This was comparatively easy to do in a small converter, but I found considerable difficulty when I came to try a 7-ton converter. There did not appear to be any difficulty in forming a fusible slag in a vessel lined with lime, since this base combines with an excess of oxide of iron to form a fusible ferrate of lime. It was only necessary, if the waste of iron during the blow were insufficient to provide the necessary oxide of iron to form a fusible slag free from silica, to add oxide of iron specially, to which course there could be no objection, while the presence of the oxide of iron would doubtless be advantageous in other ways. At the same time, lime being a basic body, would not be so readily acted upon by the oxide of iron as a siliceous body would be.

Following up these conclusions, I made several blows in a small (2 cwt.) movable converter soon after I went to the West Cumberland Works. The results of these experiments I have shown to many private friends, and I have now the pleasure to lay the details before the Iron and Steel Institute. The results with the small vessel were very satisfactory, as will be seen by reference to the analyses, and there can be no doubt as to the perfect elimination of phosphorus and sulphur when the slag is kept thoroughly basic. In order that there might be no doubt on the subject, I lined the same small vessel with the ganister in the usual way, when I found that the phosphorus refused to leave the metal, just as in the ordinary converter. I therefore patented the use of lime and limestone, magnesian or otherwise, in all the various forms in which it occurred to me that it was possible to use it, for "the lining of all furnaces in which metals or oxides are melted or operated upon while fluid," and I especially called attention to its use in the Bessemer converter, giving some details of the results of its use under these circumstances. I was perfectly well aware that limestone had been used years ago for lining the sides of puddling furnaces; but its use for this purpose was a very different thing, because the metal in the puddling furnace does not remain fluid at the end of the operation, for which reason it did not answer satisfactorily, and, as is well known, its use for this purpose is almost entirely discarded. I felt, however, that, although I had found the solution of the problem so long and anxiously looked for, my plans required to be tried on a larger scale before they were fully laid before the public, not because there could be any question that the same chemical action that succeeded with one or two cwt. of metal was likely to be reversed when operating upon tons, but because I felt that there were many points of detail that would require to be worked out. These details have been filled up by subsequent workers; but it is gratifying to me that the complete success now attained follows so closely some of the lines then laid down. I shall doubtless be asked why I did not at once follow up my discovery and put my plans into practice. My answer is, that I had just taken the management of a concern, the interests of which were opposed to the solution of this problem, and therefore having secured the ground by patent, I was compelled to wait a more favorable opportunity for putting my plans into practice. There was also a good deal of skepticism among those interests as to the possibility of solving the problem, and none seemed to care to take it up. The details of my experiments are as follows:

In the first blow, the converter was lined with ground limestone in a plastic state and fired at as high a temperature as possible for a considerable time. A small cupola was also lined in the same way. About 2 cwt. of Middlesbrough pig-iron, in which the phosphorus was about 1½ per cent, was melted in the cupola, then run into the converter and blown in the usual way. The metal blew well, and some spiegel was added at the end of the blow, which accounts for the rather high carbon in the steel. On analysis the resulting steel was found to contain:

Iron	99·842 per cent	While the slag contained:	
Carbon	·8	Silica (over)	6·0
Silicon	trace	Lime	not estimated
Sulphur	trace	Phosphoric acid	3·2 per cent
Phosphorus	·018		

In order to try whether sulphur could be removed at the same time, a second blow was made in the same apparatus, a quantity of melted mottled hematite being run into the converter, and lumps of gray Cleveland pig were thrown in with it to afford additional silicon. In order to trace the reactions which took place, samples of metal and slag were taken from the converter during the blow and submitted to careful analysis. The metal was scarcely fully blown, as will be seen from the final sample. Those taken during the blow yielded the following results:

	First sample of metal.	Second sample of metal.	Third sample of metal.
Iron	.....	98·29	....
Carbon	3·0	1·25	·66
Silicon	.....	·11	·042
Sulphur	·346	·274	·169
Phosphorus	·864	·314	·231
CORRESPONDING SLAGS.			
Fe_2O_3	12·1	.....	7·1
FeO	23·8	41·9	39·2
Silica	44·8	25·0	19·2
Lime	14·8	.....	24·0
Phosphoric acid	2·3	7·25	7·0
Sulphur	·3	·352	·512

It will be noticed that the silica in the slag is rather high in this case, and that the imperfectly blown sample No. 3 has not quite lost all its phosphorus and sulphur. The gradual diminution of these elements, however, is very conspicuous, and no doubt the fully-blown sample would have been sufficiently pure for ordinary purposes. The third blow was made from a mixture that was tolerably free from phosphorus and sulphur to begin with, in order to see whether it was possible to remove the last traces of these elements. This was a very perfect blow, lasting just

* A paper read before the Iron and Steel Institute.

fifteen minutes, and the exact times at which the samples were taken were noted. Further, in order to test the steel, some of the fully-blown metal was melted in a crucible with 6 per cent spiegel, and tested in various ways.

Third Blow.—About 100 lbs. No. 2 Bessemer pig and 30 lbs. gray Cleveland were melted together, and then blown in the same vessel.

The results were:

METALS.

	First sample, taken 2 minutes from start.	Second sample, taken 5 to 6 minutes from start.	Third sample, taken 10 to 12 minutes from start.	Fourth sample, at end of blow, taken 15 minutes from start.	After melting with 6 per cent spiegel in crucible.
Iron	.....	.....	.....	.....	98·44
Carbon	.....	.....	.....	trace	1·30
Silicon	1·505	·046	·084 (partly slag.)	·019	trace
Sulphur	·109	.....	.....	·030	·52*
Phosphorus	·327	·094	·076	·003	·052*

CORRESPONDING SLAGS.

Fe_2O_3	.....	53·8	11·42
FeO	.....	.....	49·00
Silica	.....	10·2	10·50
Lime	.....	33·0	25·00
Phosph'c acid	.....	2·88	2·05
Sulphur	.....	.....	·26

The full-blown metal was fluid, and set moderately sound. It forged and rolled well, and could be easily welded.

It stood hot and cold tests well.

A larger vessel was then prepared, and about one ton of highly-manganiferous pig blown in it, containing about 0·3 per cent phosphorus.

The blown metal contained:		And the slag contained:	
Carbon	·4	Iron	39·7
Phosphorus	·006	Silica	12·65
		Lime	28·2
		Phosphorus	·519

The metal at the end of this blow was perfectly fluid, and the lining of the vessel remarkably good. The arrangements for tilting this vessel were imperfect, and the metal had to be allowed to set in the vessel.

Lastly, a charge of 4 tons of metal was blown in a large 7-ton converter: but the lining had not been sufficiently heated, and the metal blew so cold that it could not be poured. As the vessel could not be spared for another blow, the experiments were suspended at this point. It appeared that the only serious difficulty was in getting the lining of the vessel, when put in the ordinary way, thoroughly burnt, and it occurred to me that a way out of the difficulty might be found in making bricks out of the material and burning them beforehand, but I did not go beyond satisfying myself that this was a perfectly feasible plan; and, having to devote all my energies at this time to reorganizing the West Cumberland Works, farther tests were put off. Although no experiments were made in a Siemens furnace, all chemists will agree that the reactions occurring in the Bessemer converter could be more easily obtained in the open-hearth furnace.

Some time afterward, Dr. Siemens was good enough to have his experimental rotator at Birmingham lined with limestone in a similar way; but it did not answer, for two reasons, in my opinion: 1. The limestone was a peculiarly rich one, and would not bind well before burning. 2. The temperature that could be obtained in the rotator was not sufficiently high.

It is essential that the material used for lining the vessel, and for bottoms, should be as free from silica as possible, as some of this must go into the slag, and it appears to be necessary to have a large amount of base to saturate the silicic and phosphoric acids present in the lining material or bases added to form slag, or formed for the oxidation of the silicon and phosphorus in the iron. Unless this is done, the slag becomes too acid to allow the phosphorus to be eliminated. This is seen to some extent in blow No. 2. It is a question how much base is required, but I am inclined to believe that there must be sufficient to form the basic silicate and tribasic phosphate.

Mr. Roe, who is at present engineer to the Consett Works, was engineer at West Cumberland at the time these experiments were made, and assisted in performing them.

In conclusion, I have the pleasure to place before the meeting what I believe to be the first sample of Bessemer steel made entirely from Cleveland iron by one operation, in which the phosphorus has been reduced to a mere trace. A portion has been forged into a chisel, while a rough specimen of the same has still part of the lime lining attached to it. With the samples I have placed the original wrapper bearing the date when the sample was made, and also my note-book with the original entries of the details of the analysis.

* The increase in these elements was due to the spiegel added.

A WORD TO THE MINING EXCHANGE.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Incorrect reports from San Francisco are getting in vogue. Yesterday, Consolidated Imperial was telegraphed at $3 and $3.75, stock selling here as high as $3.50; afterward a "correction," at $2.30, and many lost by it.

There is no excuse for this. The Mining Board should have *direct* communication, and all dispatches repeated. These dispatches should also be here an hour earlier than they now come—whereby a few brokers, through private telegrams, profit. The Exchange must look after its interests. "A burnt child dreads the fire," and swindled speculators may cease their ventures, and the Board suffer greatly. "EXCHEQUER."

June 11, 1879.

COMMERCE OF THE UNITED STATES.

The statement of the Bureau of Statistics of the imports and exports of the United States for April last, and for the first ten months of the current fiscal year ended April 30th, together with the returns of the corresponding period of the previous fiscal year, shows the value of imports in merchandise and specie in April last to have been $42,291,799, as against $42,475,194 in April, 1878, and in the ten months $388,655,909, as against $392,402,277 in the corresponding period of 1877-78. The coin and bullion imported in April last were of the value of $1,117,876, against $6,266,847 in April, 1878, and in the ten months, $17,106,552, as against $26,080,090 in the previous corresponding period. The total exports of merchandise and specie in April last were of the value of $57,914,429, as against $64,147,555 in April, 1878, and in the ten months $632,454,068, as against $620,449,088 in the corresponding months of the previous fiscal year. The domestic gold and silver exported in April was of the value of $2,323,370; foreign, $1,235,137; making a total of $3,568,507, against $4,011,822 in April, 1878; and in the ten months, $19,461,088, against $27,084,814 in the corresponding period of the previous fiscal year. The excess of imports of merchandise over exports of same in April last was $12,171,999, as against $23,927,386 in April, 1878; and in the ten months $241,443,623, as against $227,942,087 in the corresponding period of the previous fiscal year. The value of the imports entering the port of New York in April last amounted to $28,606,455; the domestic exports to $26,245,210; and foreign exports to $620,193.

The return of quantities and values of imports for the first nine months of the present fiscal year ended March 31st, compared with previous corresponding period, presents the following details: In iron and steel manufactures imported, the chief items are pig-iron to the extent of 134,554,019 lbs., of the value of $1,366,700, against 88,153,509 lbs., of the value of $895,449; bar iron, 46,759,168 lbs., of the value of $1,366,700, against 50,954,690 lbs., of the value of $895,459; sheet-iron, 1,986,015 lbs., of the value of $113,870, against 1,503,949 lbs., of the value of $79,252; machinery, of the value of $381,479, against $518,051; anchors, cables, and chains, 809,487 tons, of the value of $42,264, against 1,483,427, of the value of $77,736; steel ingots, bars, sheets, and ware of the value of $837,631, as against $898,431; cutlery of the value of $963,449, against $997,216; saws and tools of the value of $1,595,020, against $1,915,030. Of lead, there were exported in pigs, bars, and old lead, 1,499,627 lbs., of the value of $57,605, as against 7,492,722 lbs., of the value of $335,055. Tin, in bars and blocks, was imported to the extent of 87,313 cwt., of the value of $1,388,654, against 109,921 cwt., of the value of $1,862,625 in the corresponding period of the previous fiscal year; in plates, $1,712,286 cwt., of the value of $6,931,055, against 1,627,373 cwt., of the value of $7,542,948; other tin manufactures came up in value to $41,826, against $44,337. Of brass and manufactures of brass, the value imported was $217,412, against $202,714. Zinc was imported in blocks and pigs to the extent of 706,420 lbs., of the value of $27,488, as against 1,103,753 lbs., of the value of $50,644; in sheet, 914,771 lbs., of the value of $44,137, as against 958,911 lbs., of the value of $53,315.

Of domestic exports in the nine months, those of brass and manufactures of brass were of the value of $175,303, against $431,228 in the corresponding period of the previous fiscal year; anthracite coal was shipped to the extent of 276,231 tons, of the value of $1,073,972, as against 244,821 tons, of the value of $978,615; bituminous coal, to the amount of 207,783 tons, of the value of $687,014, against 211,218 tons, of the value of $662,499. Of copper ore, 19,504 cwt. were exported, of the value of $78,656, against 21,930 cwt., of the value of $113,084; the quantity of pigs, bars, sheets, and old copper exported amounted to 10,510,947 lbs., of the value of $1,746,155, against 7,666,454 lbs., of the value of $1,502,805. Of gold and silver, gold bullion was exported in the nine months to the value of $17,368; gold coin to the value of $2,113,406; silver bullion to the value of $7,160,504; silver coin in trade-dollars to the amount of $1,151,549, and in other silver coin, $178,091. The chief items in the exports of iron and iron manufactures were as follows: Pig-iron, 5,722,436 lbs., of the value of $72,127, against 12,053,664 lbs., of the value of $130,498; bar-iron, 1,988,801 lbs., of the value of $53,125, against 2,614,740 lbs., of the value of $60,444; railroad bars or rails, 9,569,821 lbs., of the value of $138,918, against 15,313,424 lbs., of the value of $262,036; boiler-plate, 415,798 lbs. of the value of $11,286, against 193,700 lbs., of the value of $10,083; locomotive engines, of the value of $352,233, as against $872,199; castings, of the value of $185,549, as against $215,346; machinery, of the value of $2,564,016; nails and spikes, 7,253,886 lbs., of the value of $204,205, as against 6,778,325 lbs., of the value of $209,575. Of steel manufactures, the chief items of export were 88,153 lbs. of ingots, bars, sheets, and wire, of the value of $6358, as against 86,917 lbs., of the value of $9761; cutlery, $33,570, as against $40,596; edge tools, $644,049, as against $716,588; railroad bars or rails, 1,983,011 lbs., of the value of $41,716; fire-arms of the value of $1.887,155, against $963,968; other manufactures in steel, of the value of $363,442, against $266,598 in the previous corresponding nine months. Tin manufactures were exported to the value of $63,324, against $68,942. Of zinc ore and oxide, there were exported 7894 cwt., of the value of $30,934, against 12,841 cwt., of the value of $69 992; zinc plates, sheets, pigs, or bars were exported to the extent of 1,897,707 lbs., of the value of $152,614, as against 1,739,448 lbs., of the value of $148,084.

Of foreign exports in the nine months, tin in various forms was exported to the amount of 321 cwt., of the value of $7943; copper ore, of the value of $16,478; manufactures of copper, of the value of $5870, against $110,652, in the previous corresponding period; bituminous coal, 1867 tons, of the value of $2328. The chief items in the exports of iron, steel and other manufactures were: Castings, 744,673 lbs.; railroad bars or rails of iron, 965,266 lbs. Lead (pigs, bars, and old) was exported to the extent of 663,820 lbs.; tin, in plates, 4719 cwt.; zinc, in sheets, $6395.

THE PITTSBURG IRON-WORKERS' STRIKE.—The paddlers have gained the day. At a meeting of the iron manufacturers on the 7th inst., the following resolution was unanimously passed:

Resolved, That under existing circumstances we deem it inexpedient to further resist, at the present time, the unreasonable demands of the puddlers.

ON THE METHOD OF EXTRACTING GOLD, SILVER, AND OTHER METALS FROM PYRITES.*

By W. A. Dixon, F.C.S., Cor. Mem. Nat. Hist. Soc. Glasgow.

(*Concluded from page* 403.)

The method of treatment of the concentrated ore or regulus is the same, whether the sulphides are rich in the precious metals or not, but requires variation according to—first, the presence or absence of copper; second, the proportion of copper; and, third, the presence or absence of lead.

To begin with the simplest case, namely, with pyrites free from copper. The apparatus required consists of—1, a roaster; 2, a reverberatory furnace; 3, an arsenic flue (if the pyrites are arsenical); 4, a leaden combination chamber; 5, a leaden condensing tower; 6, a series of lixiviating tanks and coolers. It is best to construct the furnace, roaster, arsenic flue, converting chamber, and tower in one line, so that the waste heat from the reverberatory furnace heats the sole of the roaster and converting chamber. The reverberatory furnace is constructed in the usual manner, but the sole is made simply of brick, and flat, with an opening in the center or side, through which the charge may be raked out into an iron hopper-wagon. The roaster is built as a muffle, with a sole of brick or cast-iron plates laid at a slight incline, to facilitate the transference of the charges. At the lower end, there is a depression of about 6 inches, forming a recess, which extends half-way over the reverberatory furnace, and has an opening which can be closed with a slide, through which the contents of the recess may be at once transferred to the furnace. At the end of the roaster is an arsenic flue, if required. Farther on, is the combination chamber, built of sheet-lead, supported by an external framing of wood; the sole is of sheet-lead, supported on iron plates over the flue. The sole is divided into eight stages, each of which is an inch higher than the one nearer the roaster. Beyond the combination chamber is a condensing tower, which may be built of brick, laid in a putty of clay and coal-tar, or, better, sheet-lead, supported by an external framing of wood. The condenser is filled with coke or pebbles, supported on iron bars covered with lead, allowing a free space for the entry of the gases evolved in the roaster. Surmounting the coke is a perforated sheet of lead, with suitable openings for the escape of the residual gases, which may be conducted by a pipe to a chimney. On the perforated lead plate, water is delivered at intervals by a self-acting tumbler, kept supplied by a cistern. The water escaping through the holes in the lead plate is uniformly distributed over the coke, and trickles downward, escaping over the sole of the combination chamber, flowing over each stage in succession, and from the lowest to a wooden cooler, whence it is again pumped to the cistern.

The roaster should have two or three small fire-places at intervals underneath the sole, to get it to a working heat, which may be closed when this is attained, the flame from the reverberatory furnace, mixed with a sufficient quantity of air through openings in the flue, then supplying sufficient heat.

The roaster sole being heated to a dull-red heat, 2 cwts. of the dressed pyrites, or ground regulus, are mixed with from 10 to 15 per cent of previously-roasted ore, and charged into the upper end of the roaster, so that it occupies about 2 feet of the length, and spreads across the sole, which it should cover to a depth of one and a half inches. The ore soon becomes ignited, evolving sulphurous, sulphuric, and arsenious oxides. The last is condensed in the arsenic flue, and the two former pass through the combination chamber to the condensing tower, and are there absorbed by the descending water.

In an hour's time, the charge is moved two feet to the left, and a second charge of the mixture is placed in the space cleared. At the end of another hour, the first charge is moved two feet to the left, the second to the space cleared, and a third is introduced, and so on, until at the end of twenty-four hours the sole of the roaster is covered. The upper part of the roaster should be at a very dull-red heat, while the lower should be sufficiently hot to decompose any sulphate of iron formed.

On the sole of the recess, from 35 to 40 lbs. of coal-dust, charcoal-dust, or other carbonaceous matter are now spread, and the calcined residue from the first charge is turned over on top of it, each charge in the roaster is moved downward, and a fresh charge of mixture introduced. In another hour, a similar quantity of carbon is spread on top of the charge in the recess, and the second charge is turned over on top, and so on, until eight successive charges of roasted residue and carbon are in the recess.

The contents of the recess are then transferred to the reverberatory furnace through the opening; the whole is well stirred up and spread over the sole. The furnace is closed, and kept at a moderate red heat for eight hours, the furnace being kept full of a smoky flame to assist reduction. The oxides are thus reduced to the metallic state, and the heat should be kept so low as to prevent the reduced iron from agglutinating into masses. At the end of eight hours, the reduced metal is withdrawn from the furnace at the opening into the hopper-wagon, which is immediately closed, so as to prevent access of air. The furnace is again charged from the recess, which has meanwhile been filled.

When the hopper is cool enough to be handled, the contents are rapidly transferred to a vessel containing water; best by placing the wagon over the vessel and withdrawing a slide in its bottom, so as at once to thoroughly wet and cool the contents.

One eighth part or thereabouts of the cooled metal is now placed in the upper stage of the combination chamber, over which water from the condenser, charged with sulphurous and sulphuric acids, is flowing. In one hour, the charge is removed to the second stage, and a second charge is introduced, and so on, until in eight hours the chamber is filled and that furnace-charge exhausted. The metal is rapidly acted on by the acids, and converted into sulphate, sulphite, and hyposulphite of iron; but by the combined action of the air and water, assisted by the heat from the flue, the first largely predominates. The charge on the lowest stage is now removed, and may be at once lixiviated with water; but it is best to keep it for a few days in a moist state, to finish the conversion into sulphite. It is then lixiviated with water, which removes sulphate of iron (also zinc, nickel, and cobalt, if present), and leaves a residue containing the gold and silver, mixed with quartz, excess of carbon, and free sulphur. The carbon and sulphur ore are then burned off, and the gold and silver separated from the quartz by washing, amalgamating, or otherwise. If the extraction of the sulphate of iron is effected with boiling water, and the liquor run into coolers, that salt may be obtained in a marketable condition; or the crystals, being calcined at a dull-red heat, yield a fine red oxide of iron suitable for painting, and sulphuric acid, which may be condensed.

If the ores contain copper in small proportion only, the roasting, reduction, and solution of the iron are conducted precisely as above described, using, however, as little carbon as possible for the reduction, so as to obtain the residue nearly free therefrom. The copper is then found in the residue principally as sulphide. This residue is roasted at a dull-red heat, and the copper is extracted by treatment with condenser liquor and crystallization, as described below, the gold and silver being obtained from the residue as before.

Ores or sulphides containing much copper are roasted at a dull-red heat, the mixing with roasted ore, roasting, and condensation of the gases being conducted as before. The well-roasted ore is withdrawn from the furnace and cooled. The cooled residue is then shaken into a lixiviating tank partly filled with a solution of sulphate of copper, containing sulphuric acid and sulphurous acid, obtained as below described; the mixture is allowed to digest, and treated with successive portions of the solid solution until the escaping liquor contains free sulphuric acid. The lixiviation is then carried on with a cold saturated solution of sulphate of copper from the coolers, which is made boiling hot in a leaden or copper boiler, until the specific gravity of the entering and escaping solutions is the same. The whole of the copper liquors is run into wooden coolers, where crystals of the sulphates of copper and iron are deposited. When the lixiviation has been carried as far as possible with the copper solution, it is drawn from the tank until it stands only an inch or so above the solid contents, and 12 inches of water are carefully floated on top, and the drawing off of the copper solution continued from below until the water is only an inch above the solid contents, when a second wash is run on, and in the same manner a third, if necessary. The copper liquors are run to the coolers as long as they mark above 20° of Twaddel; below that strength, they are run to a separate tank, to be used for the first wash of another lot.

If the ore contains silver, a little is found in solution in the copper liquor, and is separated therefrom by filtering it through a bed or beds of cement copper, or, better, precipitated sulphide of copper, before running the liquor to the coolers. The silver is recovered from time to time by roasting the precipitate, extracting the copper by condenser liquor, and melting the residual silver.

The residue in the lixiviating tanks is drained, dried, mixed with one fourth of its weight of carbon, reduced, and otherwise treated as above described, to obtain the gold and remaining silver.

The crystals of sulphates of copper and iron in the coolers are removed from time to time, drained, and dried. One ton of the dried crystals is charged into the muffle-furnace, and there exposed to a fully cherry-red heat, so as to convert the whole of the sulphates into oxides. The sulphurous and sulphuric acids evolved are conveyed to the condensing tower, which is supplied with sulphate of copper solution from the coolers, slightly diluted with the weaker wash liquor by which the acids are condensed, and used for extracting roasted ore. When vapors are no longer evolved, the calcined residue is removed from the muffle. A similar charge of dried sulphate is heated in the muffle-furnace to a dull red, so as to convert the sulphate of iron into oxide; and when fumes are no longer evolved, the charge is raked out, mixed with 2¼ cwts. of coal or charcoal dust, and charged into the reverberatory furnace, where it is melted, when sulphurous and other gases are evolved, causing the mass to boil. When boiling ceases, the oxides are added to the charge, and the melting heat continued until the whole is in a tranquil fusion, when the slags are raked off and the rough copper run into molds.

If the ore contains lead, it is found in the residue containing the gold and silver; and, if present in sufficient quantity, the residue may be smelted, and the gold and silver recovered by cupellation.

If not present in sufficient quantity to smelt, but still so much as to interfere with the amalgamation, the residue is roasted, treated with a little condenser liquor, washed, and the lead extracted with solution of caustic soda, when the gold and silver may be amalgamated. The solution of lead in caustic soda is mixed with sawdust or carbon, evaporated to dryness, heated strongly, and the carbonate of soda dissolved out with water, and again rendered caustic by lime, when the lead remains as an insoluble residue mixed with carbon.

The advantages of this mode of treatment are, that the sulphides are entirely got rid of, while if, through inattention in the roasting, some sulphides remain, only the small proportion that has escaped requires to be re-roasted, instead of the whole mass of ore, as is usually the case. In the extraction of copper from the sulphides, the whole of the copper may be obtained in the form of crystals, from which the copper may be recovered without evaporation of liquors; and in the whole of the operations, with the exception of smelting for copper, the temperatures are so low that the cheapest materials may be used for the construction of furnaces. The temperature being low, the loss of silver by volatilization is reduced to a minimum, while there is absolutely no loss of gold, except through the careless spilling of the material. Lastly, as neither salt, iron, nor other material is consumed in the process, a large source of expense in all previous wet methods of treatment is avoided; and the process is adapted for use wherever the ores are found.

* A paper read before the Royal Society of N. S. W., August 1st, 1877; and published in the *Chemical News*, London, January 3d, 1879.

MESSRS. JAMES LEFFEL & CO., of Springfield, Ohio, have issued two very instructive pamphlets—one on the uses of the Leffel double turbine water-wheel, and the other on the Bookwalter engine.

AMERICAN ANTHRACITE ABROAD.—The *Colliery Guardian* of May 30th says: "Advices received last night from New York state that 22 cargoes of American anthracite coal have now crossed the Atlantic, and have met with ready sale in Europe. One Italian firm is now negotiating with the United States for a supply of a hundred thousand tons."

ON THE ELIMINATION OF PHOSPHORUS IN THE BESSEMER CONVERTER.*

By Sidney G. Thomas, F.C.S., and Percy C. Gilchrist, Associate Royal School of Mines, F.C.S.

(*Concluded from page* 407.)

In the third blow (Table IV.) 3½ cwt. of a mixture of two parts of lime to one of roll-scale was thrown into the converter before the metal was run in. The metal was blown for 8 or 9 minutes and turned down (before the flame dropped). Nearly another 3½ cwt. of the same mixture was then thrown in, and the vessel again turned up, when the flame dropped almost immediately. After being turned down for some 50 seconds, it was (at Mr. Martin's suggestion) again blown for nearly a minute. Though it appeared that the metal was overblown, the action, on adding spiegel, was not violent. A large skull was, however, left in the converter and ladle, and much slag was produced. The blow lasted 10½ minutes. A rail made from one of the ingots deflected 9⅝ in. with the blow of 1-ton ball falling 24 ft., the bearings being 3½ ft. apart. It was considered much too soft for rails.

TABLE IV.—ANALYSES OF NO. 3 BLOW AND NO. 5 BLOW (DOWLAIS).

	Pig.	Blown metal.	Steel.	Pig.	Blown metal.	Steel.	
Si.	2·11	·33	trace	2·44	trace	trace	The "blown metal" sample of No. 3 was taken before the last minute's over-blow.
S.	·09	·09	·09	·10	·10	·10	
P.	1·27	·61 ·63	·14 ·16	1·42	·64 ·75	·64	
C.	.....	under ·10	·31 ·35	.....	under ·10	·23	

TABLE V.—ANALYSES OF CINDER FROM FOUR BLOWS (DOWLAIS).

Blow.	No. 1.		No. 2.		No. 3.			No. 5.		
SiO_2	38·8	38·7	36 08	36·3	23·95		24·2	31·7		30·7
FeO	6·4	....	5·58	....	14·55	=13·5 per cent iron	17·36	15·04	= 14 per cent iron	
Fe_2O_3	·71	....	·49	....	3·24		....	3·35		....
Al_2O_3	6·43	....	4·69	....	3·57		....	4·06		....
MnO	7·21	....	9·30	....	8·22		....	4·59		....
CaO	37·36	35·6	38·42	36·15	37·00		....	32·9		....
MgO	·26	....	·38	....	0·3		....	·26		....
P_2O_5	1·13	1·24	2·11	1·86	8·52 = P 3·72		8·60	5·93		5·8
S	....	....	·09	....	·09		....	·05		....

ANALYSES OF METAL AND SLAG FROM MIDDLESBROUGH 35-CWT. CONVERTER.

	Samples after two minutes' blow.	Si in Pig.	Metal.			Slag.					
			P.	Si.	Mn.	C.	SiO_2.	P_2O_5.	MnO.	Fe.	CaO.	MgO.
....	5½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	17½	1·49	·37	.....	.....	.....	26·6	8·8	.....	6·0	... ..	.....
....	18½	.....	·43	.....	.....	.....	18·6	12·14	.....	6·3	... ..	.....
....	19½	.....	·08	.....	.....	.....	13	11·49	.....	18·9	.....	.....
....	20½	.....	·023	.....	.....	.....	16·6	13·94	.....	9·45	.....	.....
....	21	.....	·01	.. ...	.....	.....	14·2	10·66	.....	14·5	.....	.....
....	Steel.	.....	·05	.....	.....	.....	14·6	10·6	.....	17·2	.....	.....
...	.....	.....	1·30	.....	.....	.....	35·8	·52	.....	2	.....	.....
47	.....	.....	1·06	trace.	.....	.....	32·2	3·35	.....	5·65	.....	.....
...	.....	.....	·59	"	.....	.....	22·2	11·64	.....	12·55	... ...	.....
....	.....	.....	·28	"	.....	.....	25·6	8·95	.....	10·75	.. .	.....
....	.....	.....	·09	"	.....	.....	18	11·64	.....	17·3	.....	.....
....	Steel.	.....	·13	"	.....	.....	20·4	10·89	.....	9·7	.....	.....
...	.....	.....	1·25	"	.....	.....	36·8	1·04	.....	2·4	.....	.....
46	.....	...	·34	.....	.....	.....	23·8	11·04	.....	8·3	.....	.....
....	.....	.....	·05	.....	.....	.....	20	11·49	.....	13·8	.....	.....
....	Steel.	.....	·053	.....	. ...	.....	19	12·01	.....	11·3	.....	.....
41	.....	.....	·35	. ..	.....	.....	13·8	18·34	.....	995	.....	.....
....	.....	.....	·08	.....	.....	.....	11·8	15·24	.....	16·6	.....	.....
....	Steel.	.....	·08	.....	.....	.....	12·2	13·	.....	13·75	.....	.....
....	.....	.....	·03	.....	.....	.....	.....	.....	.....	.....	.....	.....
			before Spiegel									
52	.....	1·68	·17	.....	.....	.....	16·2	12·78	.....	10·25	.....	.....
....	.....	.....	·06	.....	.....	.....	15·4	14·62	.....	15·9	.....	.....
....	Steel.	.....	·14	.....	.....	.....	13·6	12·3	.....	14·5	.....	.....

Number.	Pig.		Metal.		Slag.§					‖			
	Si in Pig.	P in Pig.	P.	C.	SiO_2.	P_2O_5.	Fe.	CaO.	MgO.	FeO.	Fe_2O_3	Al_2O_3	S.
30	.....	.....	·04	·28	13·65	11·79	16·05	.....	.....	.....	.....	.....	.....
27	1·6	.....	·06	·05 und'r	12·05	9·68	15·8	.....	.....	.....	.....	.....	.....
13	.....	.....	·04	·21	15	12·2	10·3	40·08	10·67	12·21	1·17	2·5	·12
17	.....	.....	·08	·08	13	12·5	13·2	33·43	11·7	17·5	·29	1·11	·04
20	·93	.....	·07	·22	13·6	9·4	10·5	... ..	.....	.....	.....	.....	.....
6	.....	.....	·05	·15	20	8·5	5·6	.....	.....	.....	.....	.....	.....
‡14	1·01	1·42	·045	·12	9	14·5	14·2	38·6	9·5	15·43	3·13	1·35	·09
*58	2·28	1·48	·904	.....	23·2	8·9	8·451	.....	.....	.....	.....	.....	.....
*	.....	.....	·238	.....	15·6	11·72	9·7	.....	.....	.....	.....	.....	.....
*	.....	.....	·076	.....	19·8	11·3	17·25	.....	.....	.....	.....	.....	.....
†Steel	.....	.....	·177	.....	14·4	10·39	15·10	.....	.....	.....	.....	.....	.....

*Si, trace. †Si, ·088. ‡Mn, ·24. §MnO, ... ‖MnO, in No. 13, 4·76; in No. 17, 8·79; in No. 58, 4·98. NaO, in No. 14, ·6.

NOTE.—We are indebted for these analyses, as for many others, to Mr. Stead (of Messrs. Pattinson & Stead); they only represent a small fraction of the work which Mr. Stead has devoted to this investigation.

The skull left in the converter was got out by blowing a charge of very siliceous non-phosphoretic pig. In the next (fifth) blow, 1 cwt. of a mixture of two of limestone and one of Elba ore was thrown cold into the converter before the metal was run in; rather over 3 cwt. of heated roll-scale was added subsequently, before the completion of the blow. During this blow, the lining had to be patched at the breast.

In all cases where two analyses are given, the results to the right are those of Mr. Jenkins, of Dowlais.

* A paper read before the Iron and Steel Institute, London, May 8th, 1879.

Table V. gives the analyses of the cinder that came out with the steel in the four Dowlais.

These results appear to confirm the conclusion that, for the process to be of technical value, waste of lining and metal must be avoided by making large basic additions, so as to secure a highly basic calcareous slag at an early stage of the blow. In these trials, however, it was thought prudent to feel the way, and not add at once the very large amount of base which our theory demanded, the more so as we were not able to add the bases in the molten state. It is also made clear that a slag containing under 14 per cent of iron may be very effective in removing phosphorus.

After the five blows described, the lining was found to be much worn and not in a condition to admit of satisfactory repairs. Two tuyeres had to be renewed in the fourth blow; the rest stood well.

It is obvious that without a sufficiently durable, as well as refractory, basic lining, the simultaneous dephosphorization and conversion of cheap pig in the Bessemer vessel can not rank as a commercial process. Our early experiments rendered it clear that ordinary non-siliceous lime and limestone did not constitute by themselves a satisfactory lining material; nor were renewed trials, made after becoming acquainted with a patent dealing with their application, more successful. Magnesia, the use of which as a furnace lining has been suggested by M. Caron and others, is at once very expensive, and, when used by itself, very tender. Nor did we, after repeated attempts, find it at all practicable on the large scale to use oxide of iron linings in any of the forms in which they have been used in puddling furnaces. After a very extended series of trials,* it was, however, found that, by firing bricks made of an alumino-siliceous limestone at a very intense white heat, a hard and compact basic brick is formed. These bricks unfortunately labor under the defect of a liability to disintegration when exposed to the action of steam. By the use of certain aluminous magnesian limestones and equivalent combinations, and an otherwise similar mode of manufacture, this difficulty has been overcome. For certain purposes, magnesian limestone mixed with silicate of soda solution forms an excellent material. To enter fully into the important subject of the precise conditions necessary for obtaining a satisfactory basic lining would exceed our limits, and the consideration of this as of many other interesting points must be reserved. The question of how far the heat due to the oxidation of phosphorus may replace that due to the combustion of silicon, the possibility of using in the converter low phosphoretic pig low in silicon, and the influence of silicon on the removal of phosphorus, are some of the subjects on which much remains to be said.

In advancing the proposition that the technical removal of phosphorus in the Bessemer converter is simply and entirely a question of cheaply producing a highly basic slag, containing under 20 per cent of silica and over 30 per cent of lime and magnesia, and indicating the means by which this may be secured, we are not aware that we can shelter ourselves under any very distinct authority, though surmises as to the hypothetical advantages that might be expected, were the Bessemer slag less siliceous, have not been wanting. It is, however, only proper that we should remind the Institute that Mr. Snelus stated at its March meeting simultaneously with ourselves that he had removed phosphorus in a Bessemer converter lined with limestone. Of the circumstances of this experiment we are in ignorance. It is on the production of a basic earthy slag, by the addition of large quantities of calcareous bases, and without excessive waste of lining or metal, and the construction of a durable basic lining, that, we venture to think, the economic solution of the phosphorus problem depends.

It need hardly be said that the theory here advanced as to the practicability of commercially removing phosphorus in the converter extends, *mutatis mutandis*, to the Siemens and other open-hearth processes, where, in fact, many difficulties that are met with in the converter are absent. Dr. Siemens has indeed suggested the use of a lime lining in one of his furnaces, though he has since, with his customary candor, informed us that he has failed to devise means for its successful application. The present paper will have fulfilled its purpose if it induces metallurgists to reconsider the verdict so fatal to the hopes of steel-makers, that "oxygen, whether in its free state or as oxide of iron, is almost entirely inert as regards phosphorus at the intense temperature which accompanies the Bessemer process."

In the nine months that have elapsed since our paper on the "Elimination of Phosphorus," etc., was prepared, the vigorous coöperation of Mr. Windsor Richards and Messrs. Bolckow, Vaughan & Co. has enabled the authors to submit to the Institute further evidence in support of the views then put forward. That intensity of temperature is no obstacle to the removal of phosphorus, but, under proper conditions, highly favorable to this end, has been abundantly demonstrated by the results of the working at Middlesbrough. It is, indeed, found that, other things being equal, the hotter the blow the better is the result. As regards the necessity for large additions of bases consisting mainly of lime, the experience afforded by some seventy or eighty operations is equally conclusive.

In continuation of some smaller experiments carried out in 1877 at Blaenavon, trials have been made of the effect of largely increasing the amount of oxide of iron added at the commencement of the blow, and diminishing the lime so as in a measure to assimilate the cinder to that of a puddling furnace. As was anticipated, it was found that this could not be done successfully. In the first place, the loss from excessive boiling was very great; in the second, the phosphorus is only very imperfectly removed. A very considerable amount of ore may, however, be added after the greater part of the silicon is removed. The amount of bases which it is necessary to add with Cleveland pig generally exceeds considerably 2 cwt. per ton of pig treated, the exact amount being dependent on the wear of the bottom, and the percentage of silicon and phosphorus in the pig. The presence of an excess of earthy base in the slag seems an essential condition of success. The formation of a very fluid basic slag at an early stage of the operation is also of great importance, as it enables the phosphorus and carbon to be oxidized *pari passû*, or nearly so. It will be borne in mind that the basic addition has a double function; in the first place, to preserve the lining; in the second, to form a highly basic earthy slag, so as to afford a strong base with which the phosphoric

* For most valuable assistance in these, as at every period of this investigation, we are especially indebted to Mr. Thomas Griffiths, engineer at Blaenavon. We take the opportunity of at the same time thanking Mr. Gill, assistant in the Blaenavon laboratory, for his aid in the many hundreds of analyses made in the course of our inquiry.

acid may unite at the moment of its formation. On several occasions, the experiment has been made of blowing in a basic brick lining without, or with very small, addition. The result is always excessive damage to the lining and a trifling removal of phosphorus. The density and compactness of the present lining material prevent it from playing the important part in the actual formation of the basic slag which was fulfilled by the softer and less durable linings first experimented on. The highly-freed magnesian lime bricks have, we venture to think, more than fulfilled all the expectations which were entertained as to their probable value. As, however, Mr. Richards has kindly consented to give you some account of the experience he has had with them, it is unnecessary to dwell on this point.

It has also been ascertained that, providing a highly earthy basic slag is present, the removal of almost the last traces of phosphorus may be secured by continuing the blow for some time after the drop of the flame. The phosphorus in the presence of a strong base seems to protect the metal much in the same way as carbon and silicon, so long as there is present an excess of a strong base with which the phosphoric acid can unite at the moment of its formation. When, however, the phosphorus is reduced very low, the iron begins to oxidize as in an ordinary case of over-blow.

The question of the elimination of phosphorus being the primary matter with steel-makers, it is not proposed to do more than to mention that, under the circumstances which have been described as essential to the removal of the phosphorus, a considerable proportion—namely, from 30 to 70 per cent—of the sulphur is also removed. Certain experiments made by the authors in conjunction with M. Ponsard in November last with a Ponsard furnace, in the first of which over 80 per cent of the phosphorus and 50 per cent of the sulphur were removed under very unfavorable conditions, quite confirmed the opinion formed from smaller experiments that the system described is as applicable to the open-hearth as to the Bessemer furnace. Those open-hearth furnaces, which are provided with removal hearths, offer peculiar facilities for the adoption of a brick hearth or lining.

If the results now brought before you seem to possess any value, that value is largely owing to those to whose discernment and energy it is due that opportunity has been given to develop the system under the most favorable circumstances. To Mr. Windsor Richards especially we are indebted not only for constant counsel and untiring assistance, but for being in a position to lay before you the results of working Cleveland pig on a practical scale.

In concluding, we wish to thank the Blaenavon Company for the great facilities they have afforded for the prosecution of a very protracted series of experiments, the results of a few of which have been laid before you.

NOTE.—During the Paris meeting, M. Grüner, whose eminent services to metallurgy are so well known, was good enough, while encouraging the authors to continue their experiments, to inform them that he had long held the opinion that the solution of the phosphorus problem was entirely dependent on the formation of a durable basic furnace lining.

GEORGIA MINES.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of April 19th, I find a short sketch of the mines in this vicinity, by Mr. C. E. Smith. Having had lately an opportunity to visit the Sales mine, I thought a short description of the mine might be of interest. I regret that, owing to the meager sources at my disposal, I am unable to give you fuller and more definite information in regard to it. The Sales mine is situated in Lincoln County, about 16 miles from here, and one mile from Fishing Creek, which is the only water near it. There is, however, always plenty of water in the creek.

There are several veins of rich ore running northeast and southwest through a hill about 200 feet above the creek. These veins are intersected by a gulch cutting into the hill at nearly a right angle to the course of the veins. The whole hill pans well on both sides of the gulch, but the workings have hitherto been confined to the rich veins.

The mine was first worked by a Mr. Sales and some others, in 1855, who sunk some three or four shafts on the hill 40 to 60 feet deep, and realized about $18,000. For reasons which I have been unable to learn, they abandoned operations some years before the war.

In October, 1878, Dr. Lane formed a company and leased the mine, capital consisting of pick, shovel, spade, and one riffle-box three feet long, and with this machinery they took out two hundred and forty dollars by the first of December. They then put up a flume 100 feet long, and dammed up the gulch to catch the rain-water from the hillsides. They sunk a shaft on the western side of the gulch and piled the ore, which is very soft, below the dam. The first time it rained they cleared $2700 from their flume, and by the first of April they had realized over $8000 from the flume by the help of occasional rain-storms, which, it must be said, occur pretty frequently in this region.

They then erected a Chili mill, run by a 15 horse-power engine, and were making lots of money, when, through inexperience, their shaft caved in and they lost the vein. While sinking a new shaft to find the vein, they worked the mud in the gulch (mostly tailings), getting enough out to pay expenses. On the 18th of April, they struck the vein, after sinking 106 feet, and up to the 2d inst., when I was there, they had taken out 9 lbs. of gold. (The mill yielded 27 lbs. of amalgam from the ore worked up to that time, amalgam containing about ⅓ gold.) I saw them clean out the pan after the day's work, and the amalgam taken out weighed 22 ounces.

I went down the shaft and took a panful of ore; it yielded $10 or $12 to the pan; but, as this was not rich enough for the owners, they sent down for another pan, which I washed and got out a wineglass full of gold. I mention this to show how rich the vein is in places. Dr. Lane informed me that he had got as much as fifty-two dwts. from a pan.

We have several mines here, and all that is wanted is a little capital to develop and erect stamps, and they will pay from the grass-roots down. The ore is all free-milling ore. I can not promise many mines as rich as the Sales; but there are plenty that are well worth coming to see.

Yours respectfully, D. UFFORD JENNINGS.

WASHINGTON, GA., May 12, 1879.

PROGRESS IN SCIENCE AND THE ARTS.

General Science.

The Artificial Propagation of Sponges, which was lately alluded to in this department as a possible profitable industry of the future, is said to have received an official recognition on the part of the Austrian government, under whose auspices the industry may possibly succeed. The direct cause of this action of the authorities is reported to have been the successful demonstration by Prof. Oscar Schmidt, of the University of Gratz (a well-known authority on sponges), from the results of practical experiments carried on during several years, that the artificial growing of sponges was quite easy to accomplish, and, if properly conducted, could be made a source of considerable profit.

The procedure consists simply in cutting the live sponges into small pieces, attaching the same to a wooden frame-work, and sinking it to the proper depth in the sea, in locations favorable to their natural growth. In three years, Prof. Schmidt reports, such pieces will have attained a marketable size. He estimates that the total cost of raising 4000 sponges (including interest on capital expended for three years) will be $45, and the income from their sale $80, leaving a net profit of $35. As the growing sponges, after their first immersion, will require no attention, it will be readily perceived that the quantity thus propagated could be indefinitely increased.

Prof. Schmidt's observations are simply confirmatory of those of the naturalists Brehm and Buccich, who years ago demonstrated the feasibility of artificial sponge breeding, and suggested it as a new and profitable industry, and one which in time would be rendered necessary for the maintenance of the sponge supply of the Mediterranean, in view of the rapid and improvident exhaustion of the sponge fisheries, and of the fact that the fishermen selected the very season for their active operations in which the sponges would increase and multiply by natural means. The suggestion of these savants, that the fishing season should be confined to certain months of the year, and that the artificial cultivation of sponges should be introduced and encouraged, met with similar governmental approval; but the paternal designs of the authorities and the recommendations of the savants were misunderstood, and the experimental breeding stations were destroyed by the ignorant fishermen; and until the present no effort to revive the subject has been made. It is to be hoped that the present effort may meet with better success.

This subject, we may finally remark, is not without interest for our own country, as a large stretch of the Floridan and the Gulf coast is suited for the growth of sponges, and yielded, in 1878, a product valued at $120,000. It is highly probable that this field could be very materially increased by the introduction and adoption of the plan of artificial breeding here proposed, and we regard the suggestion as worthy of the attention of parties interested in the sponge trade.

The Proposed World's Fair in New York.—The latest news concerning this project advises us that the Executive Committee had adopted a resolution announcing that in their judgment it was not advisable to fix upon a date for holding the fair until a proper site had been selected and determined on. The committee further express themselves of the opinion that the site should be located somewhere on New York Island, where the buildings or some portion thereof would be permitted to remain as an enduring monument of the event. The committee disapproved of the suggestion to call a convention of delegates from the various States and leading cities in advance of the selection of the site and the fixing of the date. The committee considered and approved a bill, drawn by Mr. Abram S. Hewitt, providing for a national recognition of the proposed exhibition, and which, in its provisions, is almost identical with that adopted by Congress in behalf of the Centennial Exhibition of 1876.

Scientific Literature.—The *Popular Science Monthly* (June) has, among other articles, the following of general interest or special importance: The Condition of Women from a Zoölogical Point of View, by Prof. W. K. Brooks; The Study of Physics in the Secondary Schools, by John Trowbridge—a plea for better and more attractive modes of teaching natural philosophy in the common schools; The U. S. Life-Saving Service, by W. D. O'Connor, Ass't Supt. U. S. Life-Saving Service—an extract from an article on the same subject in Appletons' *Annual Cyclopædia*, giving an interesting account of the plan of organization of the service, the plant of a U. S. life-boat station, with illustrations of the various life-saving appliances and the mode of using them; Are Explosions in Coal Mines Preventable? by Francis R. Conder, C.E.: the author holds that from a fourth to a half of the lives annually lost in mine explosions are sacrificed by preventable calamities, and that a great step in the direction of safety would be made if a safe lamp of high illuminating power could be devised; A Problem in Human Evolution, by Prof. Grant Allen: the author assigns natural causes for the loss of the hairy covering of the body among mankind; a biographical sketch of the late Prof. William K. Clifford, the eminent English mathematician. The number closes as usual with interesting editorial notes, correspondence, and reviews. The *Popular Science Monthly* may serve as a model of what a popular journal of science should be.

The Kansas City Review of Science and Industry (June), Prof. F. W. Putnam, gives an interesting account of "Archæological Explorations in Tennessee," describing the contents of numerous aboriginal graves at Zollicoffer Hill and vicinity. The article is illustrated with views of ornaments, pottery, etc., discovered in these prehistoric cemeteries. Rev. J. L. Templin discusses the question of the "Antiquity of Man." The author's views will appear from the following paragraph, with which he closes: "The existence of man on the earth probably extended farther back into past time than the limit assigned in the most popular chronology of the present day; but the claim for the human race of an existence reaching back through many decades of centuries, seems to be based upon an erroneous interpretation of facts, and, hence, to be destitute of adequate proof." An article entitled "Is Nature Perfect?" reprinted from the London *Monthly Journal of Science*, follows, which cleverly disposes of the dogma of organic perfection (that is, the assumption that each particular species of plant and animal is organized in perfect harmony with its surroundings), which is commonly advanced as an *a priori* objection against the theory of evolution. The miscellaneous

scientific brevities which make up the balance of the *Review* are of more than usual interest.

The *Science News*, heretofore published at Salem, Mass., will hereafter be published fortnightly at New York, under the editorial management of Messrs. W. C. Wyckoff and Ernest Ingersoll.

Geography.

The Northeast Passage Successfully Accomplished.—At the time when the anxiety of his friends and of the scientific world at large had culminated in the equipment of a special expedition for his succor, and when even the more sanguine confessed their apprehension lest the history of the unfortunate enterprise of Sir John Franklin had been repeated in his case, the happy announcement is made that the Vega, with Prof. Nordenskjöld and his crew, had reached Behring Strait in safety, having accomplished the memorable task of passing, by way of the Arctic Sea, from the Atlantic to the Pacific. After recruiting the energies of his men, Nordenskjöld proposes to return to Europe by way of the China Sea and Indian Ocean and the Suez Canal.

The voyage just accomplished is the third of Nordenskjöld's Arctic enterprises. Having in the two earlier voyages demonstrated the practicability of navigating the Sea of Kara, and of establishing, by this new highway, a profitable maritime commerce with Eastern Siberia, Nordenskjöld boldly affirmed the possibility, at certain seasons, of reaching the Behring Strait and Japan and China by the Arctic Sea. To test this practicability, the present expedition, on a larger scale than any of its predecessors, was fitted out and sailed from Gothenburg on the 4th of July, 1878, on the ambitious enterprise which has just been crowned with success. We have already recorded that the Vega (Nordenskjöld's ship) and the Lena (her companion vessel) sailed in safety through the Kara Sea, reached the mouth of the Yenesei, in Northwestern Siberia, on the 6th of August; and that, sailing thence on the 9th of the same month, they doubled the North Cape of Asia on the 19th, and on the 27th reached the mouth of the Lena, where the Vega, parting company with her consort (which proceeded up the river), set out alone to accomplish the last and most hazardous task of reaching the straits. Of what transpired after the Vega left the mouth of the Lena, the details are yet unknown. It appears to be probable, however, that she was caught in the ice and detained for months near Kellett Land, where she safely rode out the Arctic winter, and at length, as is now reported, happily reached the goal of her intrepid commander's ambition.

Engineering, Mechanics, etc.

The Interoceanic Canal Conference practically closed its official existence by the selection of one of the two Panama routes—described technically as the Wyse-Panama tide water level canal—as the most desirable and feasible route. The choice of the Conference was somewhat of a surprise to many; but when it is considered that it is one of the shortest of the seven projects presented, and is free from the numerous locks which were the objectionable features of every other plan proposed, save that of Mr. Kelley's San Blas route, it appears to us that the Conference has selected at least *one* of the best routes that were presented for consideration. The fact that the Conference expressed itself in favor of the plan of a French engineer, in preference to one of the several plans offered by our own representatives, has called forth some caustic remarks about "a foregone conclusion," etc., which, in view of the full and apparently impartial discussion of the merits of the several propositions that took place before the Conference, and the positive merits of the route finally chosen, appear to be quite gratuitous, and to savor strongly of sour grapes.

The following description presents in brief the salient features of the route selected. The canal will cross the isthmus from Aspinwall (Colon), on the Atlantic, to Panama, on the Pacific, in the State of Panama; starting on the Atlantic side from Navy Bay, and terminating in the Gulf of Panama on the Pacific, and, for all practical purposes, following the general line of the Panama Railroad, and consequently traversing an inhabited region. Two plans have been proposed for a canal at this point, both nearly alike as to location, but differing in that one provided for a number of locks, while the other (tersely defined as the "heroic treatment" of the first) provided for a tunnel in place of the locks. It is this one that was advocated by Lieut. Wyse, and that has been chosen. It will require a canal 73 kilometers (45½ miles) long, 47,000,000 cubic meters of excavation, and a tunnel 6 kilometers (3¾ miles) long. It is estimated that it will demand $240,000,000 and twelve years for its completion.

Now that the Conference has done its work, it remains to be seen what will come of it; and if the French engineers shall display sufficient pluck and energy to grapple with the formidable task, and carry it to a successful issue, where our own engineers have been content to let the golden opportunity to earn the glory of the achievement pass out of their hands, we should not envy them, but rather wish them "God speed!"

From a careful compilation presented to the Conference it is estimated that the commerce which would probably avail itself of the canal on its completion would aggregate an annual tonnage of 7,250,000 tons, an amount which, at a reasonable toll per ton for passage, should amply provide for the interest on the capital invested in the enterprise. These figures, as well as those on the estimated cost of the work, can of course be considered only as an approximation to the truth, and may be seriously modified by contingencies impossible to foresee or to provide against.

The Belgian Cable Towing System, which has been used for years on the canals and rivers of Europe, and which has given very satisfactory results on a short section of the Erie Canal, is now about to be introduced on this water-way on an enlarged scale. This assertion appears to be authorized by the published announcement that a company with ample capital has been formed for the purpose of carrying forward this work, and by whom contracts have already been placed for the manufacture of a large supply of cast-steel wire rope, and a fleet of tow-boats needful for their purpose. The introduction of this system on a large scale, it is asserted, must give even better results in this country than abroad (where it is thoroughly successful), as the conditions are more favorable for its success here than elsewhere; and the specific claims are made by its present advocates that it will add vastly to the transporting capacity of the canal, not only by increasing the speed of the boats, but also by diminishing the cost of towing.

The following details, giving the special features of the Belgian cable system, will be of interest to such as are unfamiliar with the subject: There is provided first a wire rope, which is laid down along the bottom of the canal the whole length of the course, and attached at both ends. The tow-boats (or tugs), each of which is to draw its fleet of boats, are provided with engines for giving motion to the peculiar feature of the system, namely, the device known as the "clip pulley." This is a large drum provided on its periphery with a series of movable jaws, forming a continuous groove for the reception of the wire rope. These movable jaws are so contrived that they successively close upon the wire rope as the drum revolves, and clutch it with a force directly proportioned to the amount of strain brought upon the rope by the weight of the tow. Any slipping of the cable is thus prevented—the tightness of the clutch of the pulley being automatically regulated by the amount of the load. In operating the system, the cable is raised from the bed of the canal, placed in the groove of the drum which (provided with suitable guiding and tightening pulleys) is usually placed on the deck of the tug near the bow, and the engine being started, the tug pulls itself along, and its fleet of boats in tow, by means of the cable, which it draws up at the bow, and pays out over the stern, where it falls again to its place at the bed of the canal. The record of the short section of 42 miles, from Buffalo to Middleport, which has been tried in this country, is reported to have been most satisfactory. The speed "was three times greater than the average of animal power, although seven times the amount of freight was hauled by the cable-boat." The largest tow consisted of seven canal-boats, loaded with 1499 tons of coal, the equivalent of 150 car-loads, and the mechanical operation of the drum is pronounced to have been in every respect admirable.

The company now credited with the purpose of applying the Belgian system on the large scale in the Erie Canal, is described under the title of the "N. Y. Steam Cable Towing Co.," and is reported to have already given out contracts for the construction and laying of 300 miles of cast-steel wire rope, and for the building of a fleet of 13 cable tugs.

The Record of New Railroad Construction in the United States during the year 1879, as per the reports of the *Railroad Gazette* of May 30th, figures up to a total of 570 miles, as against 385 miles reported for the same period of 1878, and 393 in 1877.

GENERAL MINING NEWS.

ARIZONA.

THE GLOBE DISTRICT.

On the Pilgrim lode, the shaft is down 26 feet, and good ore in sight. The lessees of the Rescue mine are constantly having good pay-ore on that property. The Stonewall mill, although running but 5 hours out of 24, in consequence of scarcity of water, is turning out bullion at the rate of $200 per hour; 2548 ounces of silver bullion were shipped from Globe on the 27th inst.

SILVER DISTRICT.

The *Yuma Sentinel* of May 31st says: "On the Red Cloud mine, four men are taking out twenty sacks of ore per day, uncovering a large body of rich metal at the north end of the claim, 2½ feet in width. The Iron Cap Mining Company has made a contract to sink a shaft 100 feet deep, to be completed in seventy days, at $11 per foot. It has also negotiated for sinking shafts in five other mines belonging to the company. On the Engineer mine, three men are working, the tunnel being in 50 feet, the drift 12 feet, and the shaft in the drift down 20 feet, showing a 3-foot vein of good ore."

THE YUMA MILLING AND MINING COMPANY.

It is anticipated that this mill will start up by the 20th of June. This company has contracted with the proprietor of the Madre and Carga Muchaco mines for a supply of 4000 tons of ore, which will be hauled three miles to the railroad track, where it can be dumped by a chute directly on the cars. This will be hauled three miles, then switched on the spur track, which has been built to the mill, from which the ore can be dumped almost into the mortars.

THE TOMBSTONE DISTRICT.

From the Tucson *Citizen* of May 30th we condense as follows:

"It is anticipated that the Tucson Mining and Milling Company's mill will commence crushing ore on the 2d of June. The mill is run by water-power, and the ore run through will be third-class ore from cross-cut No. 1, on the Toughnut. The new strike on the west shaft of this mine is considered a very important one, large masses of ore being found in the mine. There are smooth, defined walls in the drifts on the 110-foot levels of the Contention mine. Large amounts of fine ore are in sight. The main shaft of this mine is down 170 feet. Farther sinking will be dispensed with until the hoisting works arrive, which are expected in a very few days. The Sunset, one of the finest prospects in the district, has been bonded to a Chicago company. The yield of the Clifton Copper Mining Company is stated to be 250,000 pounds. Seven tons of rich silver ore were forwarded to San Francisco from Maricopa this morning."

CALIFORNIA.

THE BODIE DISTRICT.

From the *Standard* of May 31st we condense as follows:

"The principal feature in our mines has been the new developments in the Bodie. A drift has been run north on the new vein in the third or 433-foot level of this mine 69 feet, and south 47 feet. Winzes are being sunk on both drifts, and an upraise is now 50 feet above this drift. Among the events of the week was the unexpected cutting of a two-foot vein of fine ore in the east cross-cut from the south drift, 380-foot level, of the Bulwer mine. These 'blind' ledges are becoming a very important feature of the district, and we believe that it is impossible to do too much cross-cutting. The Standard has in different portions of the mine and in different ledges, two 'faces' of 5 feet, one of 12, and one of 15 feet of rich ore, besides several others of from 2 to 5 feet. This property never looked so well as at present. The Syndicate, Tioga, Bechtel, Black Hawk, Summit, Mono, and, in fact, nearly all the mines on the main hill, are in what may be called 'an interesting condition,' and no one can foresee what they may at any moment bring forth. At the south, the Goodshaw, Dudley, Defiance, Red Cloud, Booker, Noonday, University, Richer, and the mines on the west slope of Silver Hill, are doing important work, and one or more of them are likely to create considerable interest within a short time.

"A decidedly improved appearance is noted in the Dudley mine, large bodies of fine ore being found in the cross-cut on the 300-foot level. The average milling of the ore is between $40 and $50 per ton. The ore is a mixture of white and yellow-stained quartz. The cross-cut in this mine is in over 400 feet, the vein being over 12 feet in width. On the whole, the mine is a very promising one; but, to sink any deeper than at present, more extensive facilities will be necessary.

"The Addenda mine looks very promising. The company has sunk a shaft on the ledge to the depth of over 460 feet, drifting north and south, the drifts being about 50 feet each in length. Ore-bodies of good milling value are encountered

and active work is going forward. For the systematic development of the mine, it is proposed to introduce heavier machinery in the South Bulwer. The present outlook of the mine justifies the expenditure. The north drift on the 350 foot level of this mine shows a ledge over 2 feet wide of good ore, and the south drift, on the same level, shows a ledge fully 3 feet in width."

The *Chronicle* of May 31st says:

"How long the public will be kept in the dark as to the real extent of developments in the Bodie mine is uncertain. It would probably be best for the mine itself and all concerned in the matter were the work of development permitted to proceed uninterruptedly for another month.

"Tioga is a mine of great value as it stands, and is now working on the lower level, which promises to become of considerable importance. It is directly in the line of the big ore channel of the district, and butting against the Standard on the north as in the Bodie on the south.

"The Mono was cut out of the Bodie, and this ground is destined to play a leading part in the excitements of the district, and perhaps at no distant day. Dudley and Addenda are the most promising of the Silver Hill enterprises. The machinery for these mines is on the ground, or soon will be. There are very substantial developments now made on the present levels. The Noonday development further south, or in the Queen Bee Hill formation, has strengthened the district generally."

COLORADO.

The Highland Mary mine at Leadville is reported to have been bonded at $75,000, $5000 cash having been paid down. This mine has 13 feet of mineral, and a recent assay gave 87 ounces of silver and 45 per cent lead. Hoisting works are to be erected.

The Horse silver mine at Silver Cliff has been sold for $60,000, and the Song Bird has been bonded for $25,000.

The Hannah mine at the head of Little Evans, Leadville, is reported to have struck a deposit of ore assaying from 52 to 464 ounces.

A correspondent of the Denver *Tribune* says that there are about 500 prospectors at work at or near Chaffee City. Carbonate veins ranging from 4 to 20 feet in width have been discovered, giving assays of from 40 to 120 ounces silver per ton.

We take the following notice on the Imogene Basin from the Ouray *Times* of May 31st:

"The Hidden Treasure has been bonded for $15,000. The Millionaire, sold by W. Weston to Beverley R. Keim and Alexander Hazard, of Philadelphia, is being put in order under superintendence of Barber & Weston, and will be worked by the owners on their arrival here, which will be perhaps inside of ten days, as they left Philadelphia on the 20th of May."

The Hoosier Girl shows a streak of 8 inches high-grade copper ore. The Richmond and adjoining claim show the same vein.

It is expected that the Pocahontas will be started in July.

We take the following on the San Juan Region from our exchanges:

The Greene Smelter is hereafter to be run by the Capital City Smelting Company. Operations will be begun immediately.

The arastras of Flemming & Co. will start up in a few days. They will treat 6 tons of gold ore per day. They have over 100 tons out, ready for treatment. There will be eight or ten gold mines worked on Silver Mountain this summer. The smelter will be erected just before the mouth of Lake Fork.

The Red Rogers and Saxon mines have been bonded to Gov. Tabor for $55,000. A reporter of the *Miner* describes them as follows:

"The shaft of Alaska is down 57 feet, and a drift is being run from the bottom of the shaft along the vein, which has two streaks of solid gray copper, one 2½ feet, and the other 2 feet, and most of the ore will mill very high.

"Messrs. Higgins Bros. have a lease on a portion of Red Rogers mine. They have run a tunnel 30 feet and sunk a shaft 60 feet, and have taken out about 100 tons of ore, of which the first-class will mill 400 ounces. In the original workings of this mine, in charge of Mr. Idle, there is a shaft 40 feet deep, with a drift in a southwesterly direction along the foot-wall of the lode, which has now opened up 80 feet of stoping ground. The average width of the vein is 20 feet, and of the mineral-bearing spar from six inches to six feet; character of the ore, gray copper and sulphurets in honeycombed quartz. There are some 20 tons of high-grade ore on the dump, much of which will mill 500 ounces.

"The Saxon lode is lying idle at present. The workings comprise a 150-foot tunnel and a shaft 25 feet deep. Mill-runs from ore on this mine show it to be one of the richest in this basin; 2079 lbs. netted the owners $1459 at the Silverton smelting works, and 2100 lbs. netted $1873 at Black Hawk."

SILVER CLIFF.

We take the following from the Silver Cliff *Miner* of June 6th:

"Two of the biggest strikes, and two that are considered by experts the richest in the Sangre de Cristo range, are the Wyandotte Chief and Little Ed, the property of Parvin, Wright & Co. Assays made last week gave 60 ounces in silver and $100 in gold.

"The McLamore is the name of a mine located near Dead Mule Gulch. At the depth of 4 feet it showed up 16 oz. of silver and a trace of gold. The depth is now six feet, and a rich vein of galena measuring twelve inches is exposed.

"The Song Bird, owing to some trouble between the proprietors and the miners, is now idle. We understand liens have been filed against it by parties who have been working in the shaft. This is to be regretted, as the Song Bird is one of our best mines.

"One half of the Pocahontas mine at Rosita, was sold by Deputy U. S. Marshal Cantral, to Hon. Thomas Parish, on last Friday afternoon, for $855.47.

"The Sangre de Cristo range is attracting a great deal of attention from miners and prospectors."

A correspondent of the Denver *Tribune* says:

"The Racine Boy, lately purchased by California parties, is expected to start up shortly with a much larger force than ever heretofore worked. Mr. Farrish, who is expected to succeed Mr. Beck in the management of this mine, is now daily expected here. In addition a forty-stamp mill has been ordered and may soon be expected. But the precise location is not yet determined. If sufficient room could be found, it would be placed immediately adjoining the mine, but if not, Dr. Bell has offered the company six acres of ground on Grape Creek, about two miles distant. This will add additional expense in handling, but nothing in comparison to the past expense, as I am assured by Mr. Beck that the freight expense alone in handling the ores from the Racine Boy for the past six months would have paid for a fifty-stamp mill. The production of this mine has averaged 100 tons per week, worth at least $100 per ton, and their freight has been to Denver $13 per ton, giving an expense of near $5000 per month for freights alone on their ores. But they intend no further shipments, and are at present stacking their ores up until their new mill is ready. This, as I have said before, is to be a forty-stamp, but so arranged as to put in a hundred-stamp when necessary."

The *Fremont County Record* of June 7th says: "Very successful experiments have been made recently with coking Cañon City coal."

DAKOTA.

THE BLACK HILLS.

We take the following from the *Times:*

"Great activity exists throughout the Bear Buttes Silver District. On the Florence mine, works costing $100,000 are being erected. Red Cloud, Sitting Bull, Escondido, and the Lion mines are receiving considerable attention, the latter mine especially being considered a very promising one. The Lulu mine, in Poorman's Gulch, has a tunnel 150 feet long, mining through a very rich vein of ore 20 feet in width. The shaft of the Hoodlebug mine is down 100 feet, with cross-cuts at the bottom in 80 feet, also a cut on the top 50 feet long and 40 feet wide, all in one solid mass of ore. The clean-up of the Homestake for the two weeks ending June 1st, was 2174·80 ounces, valued at $36,427.90; that of the Giant & Old Abe, 290·93 ounces, valued at $4873·07; Highland, 331·63 ounces, value of the same, $5553.80; Deadwood, 1334·30 ounces, value $22,680.70; making a total of 4131·95 ounces; net value, $69,535.49."

To the *Pioneer* of May 31st we are indebted for the following notes:

In the Rattler mine of Lead City, the developments consist of a tunnel running south 100 feet and a cross-cut running west 42 feet. The ledge at the mouth of the tunnel is 40 feet in width and gradually widening to the end of the tunnel, where it measures 60 feet across. The ore is increasing in value as the mountain is penetrated.

The De Smet mill is to be enlarged to 120 stamps, which will also necessitate the building of extensive additions to the present structure. It is expected that the large works will be ready for operation by the first of October.

The Michigan Mining Company's tunnel at Goldenville is now in 69 feet, and the most active work is going forward upon it.

The Cheyenne Mining Company let a contract to run a fifty-foot drift from the lower tunnel of its mine. The owners of the Huxley mine, on Greene Mountain, have struck, in the bottom of their 50-foot shaft, very rich ore. The Gopher Consolidated Mining Company will erect a 120-stamp mill, which it is thought will be completed within three months. Working this mine is rapidly progressing, and a vein of 110 feet in width is established. The quality of the ore increases in richness the greater the depth attained, and the yield is said to average $35 per ton. This company has effected the purchase of the Mammoth tunnel, paying $25,000 for the same. The tunnel is 700 feet in length. It cuts the Highland Chief 650 feet from the mouth, and will reach the Golden Terra extension within the next 75 feet, thus giving ample facilities for working that mine.

Hydraulic mining at Hayward, in the Southern Hills, is said to yield $20 to $24 per day to the man. The owners of the property have constructed a flume during the past winter, seven miles in length, carrying 300 inches of water, giving them a monopoly which enables them to work the ground with great profit. The outlook in the Southern Hills is of the most encouraging character, and from a very long and extended review of their resources published in the *Pioneer* of the above date, we can not but hold the opinion that in the near future they are destined to become a very important mining center of the Hills.

THE SILVER DISTRICT.

The outlook in the Galena and Strawberry gulches is very bright, and active work is going forward throughout the district. The main shaft of the Anchor mine is down 150 feet, encountering very rich ore in its descent.

The Pennsylvania, adjoining, is a very promising property. The Union Hill mine has a shaft down 65 feet, from which considerable paying ore has been extracted.

The Hoodoo mine looks very promising. A tunnel has been drifting 200 feet into the Keystone mine with good indications. At a depth of 120 feet in the Oro Fino mine, a well-defined vein is encountered.

THE HAY CREEK COAL-FIELDS.

The *Times* of the 5th inst. says:

"Along Hay Creek, about 35 miles northwest from Deadwood, are located three extensive coal-banks. The Hay Creek Company has a tunnel in nearly 200 yards, and drifting into the same, showing a 6-foot vein of coal free from sulphur and of very good quality. The Homestake mine is being supplied with coal from this property; 25 tons per day represent the present output.

"The Philadelphia mine is in good condition and has struck a 4-foot vein. These coal deposits are to be the terminus of the railroad which is to be constructed from Lead City. There are in all about 20 men at work in these mines.

"The Giant and Old Abe mills of Lead District are being run with coal from the Red Water mines, which coal gives the best of satisfaction.

"The one-fourth interest in the Treasure mine, in Nevada Gulch, has been sold to Minnesota parties for $8250. The tunnel is in 78 feet. A large body of rich ore has been struck in the Nevada lode.

"It is reported on good authority that the Segregated Homestake has finally been sold to the Homestake Company for $120,000."

GEORGIA.

THE SINGLETON GOLD MINE.

The Dahlonega *Signal* of the 6th inst. says that this property, consisting of four lodes, is to be reopened. The Yahoola River runs through the entire property, affording ample water-power for crushing and milling purposes, etc. A ditch also belongs to the property, giving ample facility for sluicing the ore into the mill and for other purposes. A new ten-stamp mill is being erected on the mine, a very suitable site having been found for the purpose. The ore can be conveniently mined on all sides. The ores in this mine are said to be very rich, showing free gold in the pan from the top of the mountain down to the mill-site, about 200 feet northwest of the mill. The vein is said to be over four feet thick, and a true fissure. Two hundred yards above the mill, the ledge, running across the lodes about 400 feet in width, is interlaced with a large number of veins, all carrying gold, the veins varying from six inches to four feet in thickness. There is a sand-vein, which also crosses the Findley mine, being, it is said, a continuation of the Findley sand-vein.

The old Hamilton mill is located about ¼ mile below the Singleton property. It is proposed to build a new 20-stamp mill on the site, for the purpose of working the 6-foot vein, which is said to mill from $2 to $8 per ton.

The same paper observes that there is a great deal of activity in the gold mines around Dahlonega. Several new companies have been formed, and much capital is changing hands. Four new stamp-mills are now in course of erection.

IDAHO.

The *Avalanche* of May 31st says:

"There is but little change to report in connection with the progress of mining operations. The season here is still backward, but enough is doing to warrant the prospect of a fair business the coming summer and the shipment of considerable quantities of bullion.

"The Black Jack and the Hastings mines are being worked jointly. Ore is being shipped to the Ellmore and Golden Chariot mills, there being nearly a dozen teams employed. The outlook for Florida Mountain is decidedly encouraging, and the hill bids fair to resemble a huge bee-hive before long. The Chariot mill will start up next week.

"Nearly 100 tons of ore from the Owyhee were crushed recently.

"At the Clearbrook, there are some eighty tons ready for crushing which will average $60 to the ton.

"At the Ruth mine, quite a bonanza has been uncarthed within the past week; the ledge, at a point about 300 feet from the mouth of the tunnel and 150 feet from the surface, turns out to be very rich. It is about 18 inches in width and is liberally streaked with gold.

"Some of the mines at Shaw's Mountain, near Boise City, are reported to be quite rich. The arastra which is operating in that vicinity is doing well for its owners, and from a small beginning there is every prospect of a lively camp being ultimately organized there.

"In a recent letter from Cornucopia we learned that the owners of the U and I mine recently made a small shipment of ore from that place to Salt Lake for reduction. They have several more tons of good ore out ready for crushing. There are several valuable locations in the Good Hope District."

MONTANA.

We are indebted to the Butte *Miner* of May 27th for the following items:

The Alice mine and mill have now 130 men employed.

Twenty men are employed on the Gagnon mine. They are working principally free-milling ore at this mine, but it is probable that an early enlargement of the Butte Smelting Works will be made, as there are large bodies of smelting ores in sight in the mine. The Thornton mill was started up on the 24th inst. This mill is now running 5 stamps, but it is proposed to increase it to 10 during the season.

The Montana & Colorado Company has selected a site on which to build smelting works of a reverberatory style, with capacity for 12 tons per day.

THE PENOBSCOT.

A recent letter from this mine says:

"The west drift from Bonanza shaft on the 100-foot level is now opened out, and shows three feet of quartz. The east drift on the same level continues in a bar of slate; the hanging is good, but the vein is contracted to a mere seam. The west drift ore from the above shaft on the 200-foot level is showing a clear vein of free-milling ore, five feet in width, and prospects fair. The east drift on the same level is now showing a vein six feet wide; but I notice this evening a bar of slate about two feet in width coming in. In the middle of the vein these bars are often encountered, but of short duration. The stopes are all showing good milling ore. The west drift from the Snowdrift shaft is showing a vein 5½ feet in width, all good, clean quartz, and from the present appearance the vein is still wider as we advance westward. The weather is very fine, and the force on the tramway are doing well. The stringers are nearly all laid from the head of the incline to the house. The ties and rails are laid more than half-way. The carpenters are at work building the draw. The wood-work of the cars is also made, and the blacksmith is now preparing the iron-work. The wire rope and brake-straps are all ready. So you can see it will only be a short time until we get it running. The thirty head of stamps are running well, and I think the other ten will soon be ready to run. The new arastra tubs are running in good shape."

NEVADA.

THE COMSTOCK LODE.

The Gold Hill *News* of the 4th inst. says, in regard to the operations on the Comstock:

"The situation toward the north end is growing in interest. This is not so much on account of any important development or advance in work at the Sierra Nevada, as because of the change of formation in the Utah incline. This, although slight and unimportant so far as any strong present development is concerned, is really encouraging, as tending to prove a theory long since advanced, that the lower levels of that mine would show a formation of great value.

"Ophir has pierced the apex of its new formation in the incline, and its friends must wait now till a lower level is reached by the incline, and other workings test at a greater depth the value of what has already been discovered.

"The Imperial group and the mines next south are making haste slowly. There is much faith, however, still centered in this part of the lode, and time will doubtless show that it is not misplaced.

"Alta is still a much-observed mine. Those familiar with it utterly refuse to believe that the cross-cuts about to be run will not open a bonanza. That the mine has ore is beyond a doubt. It remains for the cross-cuts to tell how much and how rich.

THE SUTRO TUNNEL.

"The south lateral drift from the tunnel is already completed to the Julia shaft, and will now be extended southward. The distance from the Julia shaft to a point eighty feet east of the new Yellow Jacket shaft is 3550 feet; thence 3428 feet to a point west of the Forman shaft, or a total distance of 6978 feet from the Julia.

"On Monday, the 4th inst., one hundred and twenty men were discharged from the tunnel, together with their bosses. The majority of the men had been working west of shaft No. 2.

"Mr. Sutro, in a recent interview, said that the tunnel toward the Savage connection needs new timbering, which work must be carefully done and not hurried. The drain will be completed by July 15th. 'But,' added he, 'this will make no difference with the mines, as we have contracted to take their water.'

"Tourists now consider going in at the mouth of the Sutro Tunnel and coming out at the Savage shaft the thing to do—an underground trip of well-nigh four miles in extent—20,170 feet horizontally and nearly 2000 feet perpendicularly."

NEW MEXICO.

We are indebted to the New York *Times* for the following information concerning the gold-bearing deposits of New Mexico. The statements were made to the *Times* correspondent by Gen. H. M. Atkinson, Surevyor-General of New Mexico, formerly Commissioner of Pensions: "The gold-bearing districts of the Territory are located at Elizabethtown, Colfax County, the old and new placers in Santa Fé County, the Jicarillas in Lincoln County, the Hillsboro District in Donna Anna County, the Pinos Altos District in Great County, and the Embudo in Rio Arriba County. There is more or less of gold-lode mining in all these sections, but the principal operations are in placers. All the districts except the Embudo have been worked for some years, mostly by Mexicans, although some few Americans are also engaged in the labor. The Embudo placers were only discovered about six months ago, and those who have taken up the claims are just preparing to get fairly to work on them. They are worked in a primitive manner. The miner takes his pan and washes his dirt, as they used to do in the early days of California. Some few have rockers and cradles, and, where water is reasonably plentiful, sluicing is carried on. Of course, from these imperfect methods of working, great or startling results are not to be expected; but the men engaged in the placers generally make fair living wages—I should say from $1 to $3 a day. I have been over all this ground, and I am satisfied that there is plenty of gold there. All that is wanted is the necessary capital to organize companies and engage in hydraulic mining on a large scale. Discoveries of gold mines have also been made recently near Fort Stanton in the Capitan Mountains, Lincoln County, and assays from these mines have run from $1000 to $8000 a ton. The Sierra Blanca, or White Mountains, are also being prospected, and with encouraging success. The great drawback to successful mining enterprise in all this region has hitherto been the lack of a proper supply of water; but when capital finds its way to New Mexico, as it is certain to do in the near future, the water will be carried where it is needed, and these rich gold-placer mines will be subjected to the hydraulic treatment and forced to yield up their treasures. The Elizabethtown placers are already in communication with a fair supply of water, and are being worked very profitably. The water is conveyed in a ditch about 40 miles in length, and Embudo, the latest camp, is located right on the Rio Grande, so that there is plenty there for hydraulic mining. The old and new placers would have to be supplied by pipes from the head-waters of the Pecos, and the distance is some 45 miles; but it will pay well to lay the pipes and bring the water. With 2000 inches of water on three placers, I believe that a man could clear enough in six months to repay him his entire outlay. It is an immensely rich deposit. The Mexicans who are now working secure from 1 to 25 cents to the pan from surface mining alone. Their supply of water is limited to what they can collect over night from a small spring in the vicinity. It is amply demonstrated that below the surface the sand is very much richer, so that you may easily see what might be done by a systematic and proper development of these placers. I suppose that it would cost in the neighborhood of $500,000 to bring the water in, but it would prove an investment that would develop into a bonanza for the company that made it. The Jicarillas District is also languishing from a scarcity of water. About 12 or 15 miles distant, I am told, there is a series of small lakes which might be made available as a water supply, but I have never heard any estimate of the cost of connecting them with the mines. I know that there is plenty of gold in this district, but it can not be worked properly without plenty of water, and there will never be plenty of water until capitalists step in and take the places of the Mexicans and their pans and rockers. The Pinos Altos District in Grant County, is also very rich in gold mines—both placers and lode. There is some water there, but not enough to work the mines profitably. At Hillsboro there is quite a large camp, containing from 300 to 400 persons, and the miners there are making from $2 to $6 a day by sluicing and the use of pans, rockers, and cradles. But there, too, the lack of a sufficient supply of water is seriously felt, and, until it is brought in, the mines will never be fully developed."

UTAH.

THE OHIO DISTRICT.

A correspondent, writing from this district to the Salt Lake *Tribune* of the 7th inst., says:

"This district is situated in Piute County, in the Mount Baldy Range, and possesses advantages unsurpassed by any in this section of the territory. The winters are mild, water and timber abundant, the mines easy of access, and the country full of mineral.

"Among the leading prospects, I may enumerate the Beecher, Victorine, Emma, Rattler, Ohio, Boss, Emmet, Silver Gem, Mammoth, and Mazeppa. Assays from the Beecher, which has a six-foot vein, show from 36 to 72 per cent lead, and from $79 to $100 in gold and silver. The ores of the district generally carry a good deal of gold.

"The Mammoth mine shows a vein of six feet which assays $110, and increases with depth.

"W. S. Godbe & Co. own the adjoining mine, the Mazeppa, which is very promising and contains ores of good grade. A little work will develop this mine into a fine property.

"In the district there are several good mill and town sites which can be made available."

BINGHAM.

"The Yosemite has again resumed work, and a force of twelve men are now employed.

"A few men are at work on the Cabin Home. A larger force will be put on during the summer.

"The Old Telegraph is working quite a large force of men, a change having been made in the management.

"Work is about being started on the Benton mine. This mine is situated on the famous gold belt. Mr. Devlin intends unearthing a gold-bearing bonanza which will be second to none in Muddy Gulch.

"Many of our old-time citizens are selling out and going to Salmon River.

"Arrangements have been made for the erection of a twenty-stamp mill on the Stewart No. 2 mine. Grading has already commenced, and the mill is expected to be in running order in forty days."

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from *The Official Gazette of the United States Patent Office*, for the week ending June 3d, 1879:

No. of Patent.	*Title of Invention.*	*Name of Inventor.*	*Residence.*
216,030	Oscillating Valve	Charles J. Elliott	Pottsville, Pa.
216,051	Mechanical Telephone	Joseph W. Maxwell	Louisville, Ky.
216,061	Dredging-Scoop Nozzle for Mining Purposes	Stephen W. Shaw	San Francisco, Cal.
216,064	Regulating the Flow of Oil-Wells	Samuel S. Spencer	Oil City, Pa.
216,073	Rolling-Mill	William H. Whyte	Chicago, Ill.
216,117	Process of Casting Steel Ingots	William A. Sweet	Syracuse, N. Y.
216,118	Apparatus for the Production of Gas for Metallurgical and other Purposes	C. T. Du Motay (a)	New York, N. Y.
216,119	Gas-Generator	" " (b)	" "
216,137	Blasting-Fuse	Gustav Bloem	Düsseldorf, Prus'a.
216,148	Ore-Roasting Furnace	David W. Brunton	Silver Peak, Nev.
216,170	Rotary-Engine	Wilson N. Fort	Lewisville, Ark.
216,173	Device for Supplying Feed-Water to Boilers	Samuel M. Fulton	Pittsburg, Pa.
216,198	Stamping-Mill	Andrew B. Lipsey	W. Hoboken, N. J.
216,211	Air-Compressor	Charles Moore	New York, N. Y.

RE-ISSUES.

8,730	Steam-Boiler and Furnace	Cullin W. Reed	Chagrin Falls, O.
8,731	Damper-Regulator for Steam-Boiler	A. C. Harrison	Philadelphia, Pa.
8,735	Steam-Engine Governor	W. B. Carithers (c)	Toulon, Ill.

(a) Assignor to Edward Stern, same place.
(b) " " " " " "
(c) Assignee of William Ashby.

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received:

Bridge, iron; C. H. Hooper, Belle Plain, Minn	June 15, 1879.
Jail; Wm. Kennedy, Stephensville, Tex	" 16, "
Bridge; W. K. Sproule, Auditor, Indianapolis, Ind	" " "
Construction of Officers' Quarters, Sackett's Harbor, N. Y.; Alex. J. Perry, Dep. Quartermaster-General, Department of the East, Governor's Island	" " "
Horse and Mule Shoes: L. C. Easton, Colonel and Assistant Quartermaster-General, Army Building, New York	" 19, "
Water-Works; B. D. Paine, Mayor Monticello, Iowa	" " "
Wrapping-Paper, Letter-Scales, etc.; D. M. Key, Postmaster-General, Washington, D. C.	" " "
Ice Harbor, near Cincinnati; William E. Merrill, Major of Engineers, Cincinnati, O.	" 20, "
Architects' Designs for Museum Building to Michigan University; H. D. Bennett, Secretary, Ann Harbor, Mich.	" 23, "
Penitentiary Work—Grading, Building Sewers, etc.; W. B. Hart, Secretary, Huntingdon, Pa.	" " "
Iron Work for New City Prison; James Corbin, Columbus, O.	" " "
Jail Construction of Stone; A. W. Brown, Morgantown, W. Va	" " "
Building; Edwin Knowles, Osawatomie, Kan.	" 25, "
Dredging the Connecticut River between Hartford and Middletown, and Removing Bulkhead Rock, Providence River, R. I.; C. K. Warren, Major of Engineers, Newport, R. I.	" 26, "
Repair of Pier at Fairport Harbor, O.; John M. Wilson, Major of Engineers, Cleveland, O.	" " "
Ohio River Improvement; John M. Wilson, Cleveland, O.	" 27, "
Dike at Head of Grand Chain, Ohio River; William E. Merrill, Major of Engineers, 82 West Third street, Cincinnati, O.	" " "
Building Prison; E. V. Adel, Clerk, Groveport, O.	July 1, "
Designs for Pumping-Machinery, for which premiums will be paid, as follows: 1st best design, $500; 2d best, $300; 3d best, $200; W. E. Cutshaw, City Engineer, Richmond, Va.	" " "
Street Railroad, Maintaining and Operating the same; William G. Bishop, City Clerk, Brooklyn, N. Y.	" 3, "
Levees, Mississippi; T. S. Anderson, Greenville, Miss.	" 14, "
100,000 tons of Steel Rails to be Manufactured in New Zealand; John Knowles, Under Secretary for Public Works, Wellington, New Zealand.	Sept. 30, "
Railroad Work, Minneapolis, Minn., 250 miles; W. W. Eastman	

50 miles Heavy Rock Grading on Georgian Bay. Apply to Smith & Ripley, Collingwood, Ontario.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending June 7th, and years from January 1st:

TONS OF 2240 LBS.	1879.		1878.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co..	67,038	1,240,878	35,807	825,464
D. L. & W. RR. Co.	79,591	1,425,576	44,899	752,638
Penn. Coal Co.....	34,369	559,869	24,431	288,090
L. V. RR. Co.....	18,117	385,663	23,645	309,700
P. & N. Y. RR. Co..	782	10,126	1,373	10,966
C. RR. of N. J.....	23,377	742,010	27,558	358,982
Penn. Canal Co.....	*.....	87,679	8,447	72,567
	223,274	4,451,801	166,160	2,618,407
Lehigh Region.				
L. V. RR. Co.....	77,984	1,241,979	78,858	904,032
C. RR. of N. J.....	36,505	847,875	28,063	456,719
S. H. & W. B. RR..	.....	10,645	337	9,302
	114,489	2,100,499	107,258	1,370,053
Schuylkill Region.				
P. & R. RR. Co	139,932	2,894,869	174,768	1,547,303
Shamokin & Lykens Val.....	21,002	330,843	28,023	264,265
	160,934	3,225,712	202,791	1,811,568
Sullivan Region.				
Sul. & Erie RR. Co.	1,409	22,875	730	13,525
Total	500,106	9,800,887	476,939	5,813,553
Increase.....	23,167	3,987,334	.....	.....
Decrease	.....	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

* This report was not received this week.

Statement of Coal Business at Fair Haven for the week ending June 7th:

	Tons.
Receipts.	552
Shipments.....	.....
On hand June 7th.....	35,962

Perth Amboy Business:	Tons.
Received for the week	28,868
Shipped for the week.....	35,979
On hand June 7th.....	130,953

The increase of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 54,186 tons, as compared with the corresponding period in 1878.

Belvidere Delaware Railroad Report for week ending June 7th:

	Week.	Year. 1879.	Year 1878.
Coal for shipment at Coal Port (Trenton)	491	1,529	719
Coal for shipment at South Amboy	8,370	199,284	202,901
Coal for distribution.....	7,545	141,618	69,279
Coal for Company's use	1,501	35,419	34,323

Coals Cleared on the Canals of the State of New York for the week ending June 7th, and year from the opening of navigation:

Tons of 2000 lbs.	1879.		1878.	
	Week.	Year.	Week.	Year.
Anthracite.....	47,422	179,442	27,452	95,222
Bituminous.....	5,252	16,601	6,862	25,339
Total amount cleared..	52,674	196,043	34,314	120,561

The Production of Bituminous Coal for the week ending June 7th was as follows:

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb	35,714	594,128
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs.....	7,319	153,220
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.....	2,402	61,066
*East Broad Top.....	1,356	30,315
Clearfield Region, Pa.		
*Snow Shoe.....	1,483	14,467
*Tyrone and Clearfield.....	31,442	600,908
Alleghany Region, Pa.		
*Pennsylvania R. R	4,020	78,860
Pittsburg Region, Pa.		
*West Penn R. R.....	2,864	85,722
*Southwest Penn. R. R.....	468	16,944
* Penn & Westmoreland gas coal, Pa. R. R.....	703	334,070
*Pennsylvania R. R.....	11,931	194,105

*For the week ending June 7th.

The Production of Coke for the week ending June 7th:

Tons of 2000 lbs.	Week	Year.
Penn. R. R. (Allegheny Region).....	1,040	69,155
West Penn R. R....	11,055	20,308
Southwest Penn. R. R.....	21,350	42,037
Penn. & Westmoreland Region, Pa. R. R.	14,296	381,799
Pittsburg, Penn. R. R.....	3,160	61,076
Total.....	40,901	574,375

THE COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 13, 1879.

Anthracite.

The advance in the price of coal has considerably reduced the demand. The companies attempting to secure the full advance are doing but very little business. Fully nine tenths of the sales are made at a large concession.

Producers have not been fairly tested in their efforts to advance prices, owing to the fact that they were well supplied with orders previous to making the advance. When these orders have been filled, there may be a temptation to make concessions again. The prospects are that July may be a quiet month, as it usually is, but for the balance of the year a very good demand is indicated.

The production of anthracite coal last week was 500,106 tons, as compared with 592,004 tons the previous week, and 476,939 tons the corresponding week of 1878. The total output from January 1st to June 7th was 9,808,887 tons, as against 5,813,553 tons for the like period of last year, showing an increase this year of 3,987,334 tons.

Bituminous.

There have been no important transactions in this class of fuel; there is, however, a fair business doing. The prospects for an advance in anthracite give great encouragement to the producers of bituminous coal. They say that a very slight advance will greatly increase their fall business.

Chicago. May 31, 1879.

[Specially reported by Messrs. RENO & LITTLE.]

Retail prices of coal delivered per ton of 2000 lbs

Lackawanna Stove	$4.50	Cannel	$6.00
" Chestnut	4.50	Wilm'gton & Ill	3.00
" Egg	4.50	Indiana Block	4.25
" Grate	4.50	Blossburg	5.50
Erie and Brier Hill	$5.00	Piedmont	6.50

Sandusky. June 4, 1879.

[Specially reported by Messrs. BLACK & CLARKE, Agents, Con Coal and Mining Company.]

The coal market here, owing to the very low prices on anthracite, has been completely demoralized. The contract for supplying the public schools was awarded at $3.39 for egg and stove, delivered. The present prices are:

Per ton of 2000 lbs.

ANTHRACITE ON BOARD CARS.

	Grate.	Egg.	Stove.	Chest
Lehigh.....	$3.50	$3 50	$3.50	$3.50
Wilkes-Barre.....	3.50	3.50	3.50	3.50
Pittston.....	3.50	3.50	3.50	3.50

Prices retailed, delivered, 25c. above car prices.

BITUMINOUS.

	On cars.	Retail delivered.
Massillon.....	$2.60	$3.25
Straitsville	2.35	3.00
Shawnee	2.25	3.00
Piedmont.....	3.80	4.50

San Francisco. June 5, 1879.

COAL.—Imports from January 1st to June 1st:

	Tons.		Tons.
Anthracite.....	3,811	Cumberland.....	1,387
Australian.....	7,940	Seattle.....	63,458
Coos Bay.....	18,072	Tacoma	845
Carbondale.....	746	Vancouver Island....	61,979
Carmel Bay.....	350		

The market is sluggish for all kinds, and low prices continue to rule. Sydney steam is freely offered to arrive within 60 or 90 days at $6.25, without finding buyers to any extent. We note the arrival of the Frances Thorpe with 1657 tons Australian; the Colusa from Newcastle, N. S. W., with 1830 tons Wallsend; and the Woosung from same with 914 tons. These three cargoes were sold prior to arrival at or about $7.50. Other arrivals during the week include the following: From Coos Bay, 350 tons per Gussie Telfair; Empire from same, 430 tons; Whistler from Seattle with 804 tons.—*Commercial Herald.*

Toledo. June 11, 1879.

[Specially reported by Messrs. GOSLINE & BARBOUR.]

Since our last to you, quoting prices on anthracite, the advance by the mining companies has extended through the West, and present quotations are:

ANTHRACITE.

Ton of 2000 lbs. delivered.

	Grate.	Egg.	Stove.	Chest.
Pittston.....	$3.75	$3.75	$3.90	$3.75
Wilkes-Barre	3.75	3.75	3.90	3 75
Lackawanna.....	3.75	3.75	3.90	3.75

The following are the prices f. o. b. cars:

Grate.	Egg.	Stove.	Chestnut.
$3.00	$3.00	$3.25	$3.00

BITUMINOUS.

Ton of 2000 lbs.

Straitsville lump.....	$2.35	Massillon nut.....	$2.25
" nut.....	2.00	Willow Bank lump....	2.75
Shawnee lump	2.60	" nut.....	2.25
" nut.....	2.25	Cumberland	4.00
Hocking Valley lump.	2.35	Blossburg.....	4.00
" nut..	2.00	Morris Run.....	4.00
Massillon lump	2.75	Gas Coal	3.25

With market firm and good inquiry, the other quotations remain unchanged.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 13, 1879.

American Pig.—There have been no important transactions, yet there is a very good feeling among the producers. The Thomas Iron Company has had inquiries for as much as 60,000 tons of iron during the past week for delivery during next year. The makers of iron are expecting an increase in the cost of producing, and it is very probable that with the opening of the fall trade an increase in the cost of iron will also take place. There is but very little stock either with producers or consumers. We quote No. 1 Foundry at $19; No. 2 Foundry at $18; and Forge at $16@$17.

Scotch Pig is dull and without particular feature. We quote Eglinton at $19@$19.50, and Coltness at $22@$22.50.

Messrs. John E. Swan & Brothers, of Glasgow, under date of May 30th, report 89 furnaces in blast, against 91 furnaces a year previous. The quantity of iron in Connal & Co.'s stores was 265,668 tons (an increase of 2290 tons for the week), as compared with the stock at same date in 1878. The shipments show a slight increase for the week, and an increase of 46,815 tons since Christmas, as compared with the same period last year. The imports of Middlesbrough iron in the same comparison show a falling off of 24,866 tons. No. 1 Scotch pig-iron was quoted as follows: Gartsherrie, 46s. 6d.; Coltness, 51s. 6d.; Langloan, 49s. 3d.; Summerlee, 45s.; Carnbroe, 44s. 6d.; Glengarnock, 45s.; and Eglinton, 42s. 3d. Middlesbrough iron was quoted, f. o. b., Tees, as follows: No. 1 Foundry, 38s. 6d.; No. 2, 37s.; No. 3, 35s.; No. 4, 34s. 6d.; and No. 4 Forge, 34s.

Rails.—There is a very good inquiry, and it is said that an effort to secure a large quantity of steel rails for next spring's delivery at $47 at mill found no takers. We learn of a sale for early delivery at $46 at mill. We learn of no important transactions in iron rails, which are quoted at $37@$39, according to delivery, etc.

Old Rails.—These are very firm, without business. We quote at $22.50.

Wrought Scrap.—This is also dull. We quote at $23@$24.

Edward Williams, President of the Iron and Steel Institute of England, will be here this summer.

We publish the following letters from our correspondents:

"BALTIMORE, June 9, 1878.

"There is an increased demand for car wheel and foundry iron, and the trade is active for this season of the year, with no stocks at the furnaces. Prices are very firm at about last quotations."

"COLUMBUS, O., June 10, 1879.

"The pig-iron market for the past week has been rather quiet. The closing of mills on account of labor troubles has made the demand for gray forge irons light, but all grades of foundry have good demand for this season of the year. Quotations are unchanged."

"LOUISVILLE, KY., June 10, 1879.

"There is some inquiry for iron for future delivery. The sales for immediate consumption are light. Prices are about the same."

"PITTSBURG, June 10, 1879.

"The lock-out and strike, which threatened to be of long duration, terminated somewhat abruptly last week, and affairs in this market have resumed their normal condition. There is a good deal of dullness yet, although the belief in a good time coming was never stronger than at present. Pig iron is in ample supply for all wants, and prices are unchanged."

"CINCINNATI, June 10, 1879.

"Prices here remain as last reported."

Philadelphia. June 12, 1879.

[Specially reported by JUSTICE COX, JR., & Co., Iron Merchants, 333 Walnut street, Philadelphia.]

Pig-Iron.—It is coming to be the time of year when sales of pig-iron fall off, as mills and foundries at this time begin to curtail the purchases in anticipation of stock-taking, and a short stop in July for repairs, etc.; but so far, this has not been felt by purchasers of iron, as orders continue to come in for about all the No. 1 and mill iron that the furnaces can turn out in this neighborhood, while No. 2 is in more plentiful supply. The market can be quoted from $18.50 to $20 for No. 1, and $16.50 to $17.50 for No. 2; $15.50 to $17 for Gray Forge.

Manufactured Iron.—The demand for bars is much improved, all mills running in this neighborhood having about all they can do to keep up with their orders. The plate mills are all full of orders, but prices do not advance as they should and could if the price was asked by producers. The skelp mills also have about all they can do for the present. We quote: Bars, 1 8-10 to 2c.; plate and tank, 2¼ to 6c.; skelp, 1 95-100 to 2 11-10c. per ℔.

Rails.—The steel-rail mills continue to have all they can do for the balance of the year at full prices. The iron rail mills continue to run to their full capacity. We quote: Steel, $43 to $45; iron, $32 to $37, all at mills.

Old Rails.—The demand for old rails is good. All lots for prompt delivery are quickly taken up at full prices. We report sales of 1000 tons, prompt delivery, at $23, and quote $22.50 to $23.

Scrap.—Wrought is quoted at $21 to $24; cast, $12 to $17.

METALS.

NEW YORK, Friday Evening, June 13, 1879.

The past week has been a quiet one in the metal market. It is usual to look for a dull time during the latter part of June and the early part of July, and we suppose this year will be no exception.

RECEIPTS OF METALS AT NEW YORK FOR THE WEEK ENDING JUNE 12TH AND YEARS FROM JANUARY 1ST, 1878 AND 1879.

	1879.		1878.	
	Week.	Year.	Week.	Year.
Copper, bbls. ..	537	4,325	1,126	7,331
Copper, boxes.	.....	.....	.....	113
Copper, cakes...	1,835	10,302	375	6,339
Lead, pigs.....	756	98,913	3,093	154,488
Spelter, pieces..	.....	45,161	.....	25,062
Quicksil'r, flasks.	.....	4.125	25	583

Copper.—There is comparatively nothing doing in this article, which is nominal at 16¼. London advices of the 3d instant say :

"We omitted to notice in our reports of last week, sales of about 600 tons Chili regulus, on spot Swansea, at 11s. 3d. per unit ; also of a cargo of Bolivian ore and regulus to arrive there, at 10s. 9d., and 11s. 1½d., respectively. Chili charters from May 9th to 30th consist of 1250 tons bars and ingots, 400 tons pure in ores and regulus for England, 250 tons bars for France.

	1879. Tons.	1878. Tons.	1877. Tons.	1876. Tons.
Charters, January 1st to May 31st.....	20,639	18,452	18,871	17,249
Charters, May only...	5 700	3,353	2,995	2,884

"The price at Valparaiso, 30th ult., was $17.10, exchange 31d., which, with steamer freight, 60s., is equal to £54¾, Liverpool, without merchants' commission. There is, however, a doubt about the freight, which some think is reduced to 50s., in which case the price delivered, Liverpool, would be only £54¼. The market is in a somewhat undecided state, the quotation for fair ordinary brand being nominally £55¼, and scarcely buyers or sellers. We note since our last only about 100 tons bars, all of which went at said figure."

From London, under date of May 30th, we have received the following :

"Bars maintain the slight improvement which we noted yesterday, about 100 tons of good and favorite brands being reported this afternoon at £55¼ cash. At this figure the market closed with a firm appearance, and sellers seem likely to maintain the advance, in the hope that the advice of charters may not prove as heavy as most buyers profess to expect will be the case. Nothing doing in Australian. Quotations for Burra and Wallaroo Cake are £62@£62¼."

Under date of the 31st we have received the following statistics :

Statistics of Copper in London, Liverpool, Swansea, and France.

		—Stocks.— May 31.	April 30.	
Fine foreign, chiefly Australian		7,056	7,682	London.
Chili	Bars	49	49	
	" and ingots	24,669	24,853	Liverpool
	In ores and regulus	4,283	3,987	& Swansea.
Totals, England		36,057	36,571	
Fine foreign, chiefly American		350	300	France.
Chili bars, ingots, and barilla.		4,604	4,622	
Total		41,011	41,493	
Chili, chartered and afloat	Mail	7,163	7,341	
	Telegram	6,900	2,600	
Tons		55,074	51,434	
Chili G. O. B.'s		£55¼	£55¾	
Wallaroo cake		62¼	62¾	

		—January 1 to May 31.— 1879.	1878.	1877.
Imports.	Chili	19,498	22,069	22,456
	Other foreign	7,059	5,582	8,579
Tons		26,557	27,651	31,035
Deliveries.	Chili	17,234	17,368	21,687
	Other foreign	6,097	4,067	6,351
Tons		23,331	21,435	28,038

Tin.—There has been a business in this market of about 100 tons. At the close 15½c. was bid and 15¼c. asked for round lots. For jobbing lots 15¼c. has been paid. The London quotation for Straits is £67. Singapore quotes at $20, and Penang at $19.50, with exchange at 3s. 11½d. L. & F. is quoted at 14¾c., and Refined nominal, at the same price.

London advices of the 3d say :

"Dutch deliveries for May were 705 tons : London, 1051 tons; Overside, 310 tons ; stock here, 10,658 tons. Price of Straits and Australian, 66½s. cash, and a small business done."

London advices of May 30th say :

"Tin is rather dull, and values a shade easier. Australian and Straits are nominally 66½s., but holders intimated that they were open to offers at 66¼s. cash."

Tin Plates.—There has been a very strong market, although somewhat dull during the last two days. We quote per box as follows : Charcoal, bright, Melyn grade, ⅛ X, at $6.37½@$6.25, and Allaway grade at $6@$5.75 ; charcoal ternes, Allaway grade, $5.50@$5.62½ ; coke, bright, B. V. grade, $5, and coke roofing, 14×20, $5.

Messrs. Robert Crooks & Co., of Liverpool, under date of May 29th, say of tin and terne plates :

"The only element of strength is the increasing probability of one day per week further stoppage of work by manufacturers. This, even taking into account the fact that the coming six weeks are the dullest in the year, is having the effect of making buyers decidedly more anxious to place their specifications ; but still they are, as a rule, not disposed to pay prices asked."

Lead.—There has been a small business in this market at 3¾c., although several hundred tons have been sold at St. Louis on a higher basis. The market is very strong, and is based upon the knowledge of the small amount of lead that will be produced as compared with what was estimated. Whereas, it was estimated that the production of Leadville would amount to from 20,000 to 30,000 tons, we are now advised by a very high authority that the bullion product will not exceed 12,000, making only from 10,000 to 11,000 tons of lead. Utah reports a falling off of about 3000 tons already. Missouri, as is well known, will show a large decrease, and Nevada will probably show some. As the active season will soon come on, the advance in the price of lead does not seem unwarranted, and we should not be surprised to see 4c. reached, as is predicted. The reserves are already being encroached upon.

The San Francisco *Commercial Herald* of June 5th says :

"The Seminole, for New York, carried 3250 bars Richmond lead, shipped by Daniel Meyer ; 4062 bars Melrose; and 309 bars Oakland S. and R. Co., shipped by M. F. Tarpey and Charles Ulrich ; combined weight of all, 848,705 lbs."

Spelter and Zinc.—Spelter is quiet at 4¼@4½c., and Sheet Zinc at 6@6⅛c.

Antimony.—Cookson's is quoted at 11⅞c., and Hallett's at 11½c.

Quicksilver.—The San Francisco *Commercial Herald* of June 5th says : "The market is without life or animation. The China, for Hong Kong, on the 3d inst., carried 1900 flasks ; price, 35@35½c. The City of Panama, for Mexican ports, had 490 flasks."

THE BULLION MARKET.

NEW YORK, Friday Evening, June 13, 1879.

The London market has rallied from last week's depression, on the statement of Mr. Goschen in the English Parliament that the German government would not sell any more silver. Whether the price will still further advance, or the present figures be maintained, will depend upon the India and China exchanges, as there is really no special demand for silver from any other quarter than the East.

Messrs. James Lewis & Son's monthly circular, dated from Liverpool, May 31st, contains the following relative to silver :

"The arrivals have been moderate and the demand chiefly for the Continent, for which the orders were filled from the German government supplies during the early part of the month at 50¼d. per oz., but, the demand subsiding, the value fell to 50 1-16d. About a week ago, it was announced that the German government intended to withhold from the market for some time their further stock of about £10,000,000, and some excitement and speculation consequently followed, the price advancing to 51d., at which some sales were made for India, and a considerable quantity was taken for the Continent. The India Council Drafts on the 28th instant went at 1s. 7¾d. In consequence of the expected failure of the silk crop in Europe, there has been an active demand for Mexican dollars for China, which close at 51¼d. per oz. The quotation for bar silver to day is 51¼d. per oz., standard. The arrivals of silver ore during the month amount to about 40 tons, and of silver lead ore to about 70 tons."

LONDON, June 13.—The letter to the Under-Secretary of State for India, giving the views of Lord Odo Russell, the British Ambassador to Berlin, in regard to Germany's coinage policy, confirms the announcement of the German government's determination not to sell any more silver at present. It further says that the German government has $50,000,000 in silver on hand, which will increase during the suspension of sales ; and it is added, on the authority of Lord Odo Russell, that it is generally believed by financial men in Germany that the government is preparing to introduce and adopt the double standard, as in France.

"This news," says the London *Times*, "may be quite correct, for the economic vagaries of the German government in all directions are unknown quantities, and we may be prepared to accept the perpetration of any folly after what the last few years have revealed. Still, it would be well to receive this news with caution, for more reasons than one. The belief of financial men in Germany is hardly sufficient ground on which to come to the conclusion that silver will be remonetized forthwith. As a whole, however, the tendency of the extracts contained in the parliamentary paper, where this letter appears, is to show that a recovery in the value of silver is quite probable ; that Germany will cease to sell till the price rises again, is also very likely, for the loss so far has been rather severe. She is, besides, behindhand with her silver coinage, quite apart from any question of a double standard, and in the end may not have much more to sell. The production of silver, moreover, has been far less in proportion to gold than is popularly supposed, and its consumption is greater than those who advocate the adoption of bimetallism for England have allowed for. All this fully justifies the opinion that the depreciation of silver has been unduly great ; but it by no means follows that an immediate and great rise is to take place. The lesson taught by the recent experiments with India Council drafts should not be so lightly forgotten. While these drafts are kept small in amount, silver advances in price ; but the moment they increase to any thing like the level of the requirements of the Indian government, the market gives way.

"This state of things must, to some extent, continue, whatever the intentions of the German government may be, and whatever the relative production of silver and gold, as long as the amount of India Council demands to meet home payments nearly equals or exceeds what the excess of the export trade of India can loan. It can not be too often reiterated that therein lies the true difficulty of the silver question."

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
June 7 ...	51¾@2	113¼	June 11	51½	112½
June 9. ..	51⅝	113	June 12	52@52¼	*
June 10....	51½	112½	June 13	52⅝	115

* 113¼@11⅛.

BULLION SHIPMENTS.

We give below a statement showing the latest bullion shipments in addition to those announced in our issue of June 7th :

May	26th	Indian Queen	Nev...	$3,875.63
"	31st	Alexander	"	9,100.00
"	31st	Ophir	"	31,945.99
"	31st	Northern Belle	"	6,652.38
June	2d	Argenta	"	10,500.00
"	2d	Independence	"	10,100.00
"	4th	Hillside	"	16,100.00
May	11th	Monarch	Idaho	11,000.00
June	3d	Christy	Utah	10,873.00

The Leeds mine, of Utah, is producing from 30 to 40 tons of second-class ore daily.

Horn-Silver Mining Company.

	Lbs.
Bullion on hand May 24th.	1,105,628
" received from May 25th to May 31st, inclusive	139,062
	1,244,690
Shipped to Chicago and Omaha	274,036
On hand.	970,654

From July 1st, 1878, to April 28th, 1879, the Hillside mine produced $305,757, of which $11,666 was in lead, and the remainder in gold and silver.

Bullion in the Bank of France has been increasing steadily during the last two years. *Le Temps* accounts for the large proportion which silver bullion has of late assumed, partly by the regulations as to discounting, which place the bank at a disadvantage alongside of its competitors, and partly by their competition, but in part also by its cellars being a refuge for the depreciated silver. December 31st, 1876, the cash and bullion at the bank amounted to 2,169,000,000 francs. Of this sum 1,530,500,000 francs was in gold and 638,500,000 francs in silver. December 31st, 1878, there were only 983,500,000 francs in gold, silver having risen to not less than 1,058,000,000 francs. The note circulation has varied but little during the increase in the amount of silver.

Washington dispatches prepare for the expectation that the Senate will refuse to discharge the Finance Committee from the further consideration of the Warner Silver Bill, and that the bill will go over to next winter.

The exports of specie from New York for the week ending June 7th, amounted to $1,173,965, of which $721,873 was gold and the balance silver, consigned principally to London bankers. The steamer Scythia, which sailed on the 10th inst. to Liverpool, took out $250,000 gold.

England and the Silver Question.—LONDON, June 12, 1879.—In the House of Commons to-night, in the debate on the Indian Budget, the Right Hon. Mr. Goschen pointed out that the main causes of the depreciation of silver, as American over production and German demonetization, were not likely to continue in operation much longer, and as he was most distinctly assured, upon high authority, that the German government did not intend to sell any more silver, he strongly advised the government not to make any radical change in the existing system of Indian coinage.

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	SHARES. No.	SHARES. Par Val.	Last Dividend. Mo.	Last Dividend. Y.	Last Dividend. A't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted, so much per share. June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10 H.	June 10 L.	June 11. H.	June 11. L.	June 12. H.	June 12. L.	June 13. H.	June 13. L.	SALES.
	$		$				Per c'nt													
Consol. Coal.	10,280,000	102,500	100	Jan.	'77	2½	....	.....	.....	22	22	.....	.....	.....	.....	.....	.....	.....	.....	8,017
Del. & H. C.	20,000,000	200,000	100	Aug	'76	4	9	49	47½	48⅝	48⅜	48¾	47⅞	48¼	48	48¼	48⅛	48¼	48⅛	79,575
D., L. & W. RR.	26,000,000	624,000	50	July	'76	2½	5	59¼	58½	59⅛	59	59	58¾	58⅝	58⅛	59¼	58¼	59⅛	59	10,537
Lehigh C. & N.	10,148,950	208,971	50	Nov	'76	1½	5½	24⅞	21⅞	24⅛	24⅛	25¼	25	25¼	25¼	25⅛	25⅛	25⅛	25⅛	1,339
Leh. Val. R.	27,228,855	540,858	50	June	'79	1	4	30½	30½	30¾	30¼	30⅛	30⅛	30⅛	30	30⅛	30	30¼	30¼	2,500
Maryl'd Coal	4,400,000	44,000	100	Jan.	'76	1½	1½	.....	.....	11	10	14	13	13	13	13¼	13½	.....	.....	34,092
N. J. C. & R. R.	20,000,000	200,000	100	Apr	'76	2½	2½	52⅜	51½	52¼	51¾	52⅜	51⅛	52	51½	51⅛	50⅝	52⅜	51¼	20,374
Penn. Coal...	5,000,000	100,000	50	May	'78	3	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Penn. R. R...	68,870,200	1,377,404	50	May	'79	2	8	37¼	37⅛	37⅜	37¼	37⅜	37⅛	37¼	37¼	37⅛	37¼	37⅛	37⅛	
Ph. & R. R. R.	24,278,175	485,563	50	Jan	'76	4½	10	20¼	19⅝	20	19⅝	20⅛	20⅛	20⅜	20⅛	20⅜	20⅛	20½	20⅜	

The Delaware and Hudson Canal Co. has paid in dividends to date $38,821,104, and the Philadelphia and Reading $43,012,497

Total Sales.....182,457.

Mr. Stanhope, Under-Secretary for India, expressed his agreement with the greater part of Mr. Goschen's speech, and added that he recognized the difficulty of dealing with so delicate a subject.

PARIS, June 10.—The *Globe*, the new daily journal, understands that the demonetization of silver fractional currency in the Island of Réunion is the first step in the demonetization of silver to be applied on a vast scale, with the object of combating the tendency of foreign countries to send their surplus silver to France.

Redemption of Fractional Silver Coin.—WASHINGTON, June 12.—The following is the full text of the regulations governing the redemption of fractional silver coins issued by the Treasury Department:

"Fractional silver coins for exchange should be put up by denominations and each package marked with the amount it contains. Exchanges will be made only in total sums of $20 or any multiple thereof. No charges for transportation will be paid by the Department either on the coin received or the remittances thereof. No coins mutilated so as to be unfit for circulation will be received.

"When the total amount of dues in any one payment to the government can not be paid entirely in lawful money of the denomination of $1 or greater because involving a fractional part of a dollar, such fractional part may be paid in silver coins of denominations of less than $1; but when the total amount of such dues does not exceed $10, such total amount may be paid in the silver coins of denominations of less than $1.

WASHINGTON, June 12.—The House Committee on Coinage, Weights, and Measures, agreed to-day to report a bill directing that the Treasury shall exchange standard silver dollars for trade-dollars, and melt the latter and stop the coinage of the same.

There were no purchases of silver by the Director of the Mint to-day. All the bids were rejected, the offers being considered too high.

Salt Lake Ore and Metal Market.

Mr J. B. Meader, under date of the 7th inst., reports the following:

	Lbs.
Shipments of base bullion for May	2,567,547
" " " four months	10,215,507
Total for five months	12,783,054
Ore shipments for May reduced to lead	20,800
" " five months " "	785,560
	806,360
Total shipments of lead for five months, 1879	13,589,414
Same time for 1878	19,838,867
Decrease in 1879	6,249,453

The shipments of ore and bullion for the week ending May 21st were as follows: Mingo, two cars bullion to Pittsburg; Horn-Silver, eight cars to Chicago; H. M. and M. Co., four cars to Omaha; Horn-Silver, twenty-one cars to Omaha; Morgan, four cars to Omaha; Telegraph, eight cars to Omaha; Chicago, two cars to Omaha; Scott & Anderson, two cars copper matte to Baltimore; and Wild Dutchman, one car lead ore to Omaha; total, fifty-two cars. Bullion, 1,024,949 pounds; lead ore, 20,000 pounds; and copper matte, 43,498 pounds; total, 1,088,444 pounds. The Morgan furnace has shut down. The French Company is repairing. The Horn-Silver is mining full capacity; the Mingo, one stack; Germania, one stack; and the Chicago one stack.

FINANCIAL.

Coal Stocks.

NEW YORK, Friday Evening, June 13, 1879.

Taken on the whole, the market during the past week has been very dull and devoid of anything unusual or important. The sales of Delaware, Lackawanna & Western amount to 79,525 shares, against 129,412 last week; prices, however, ranged more evenly; 59¾ the highest point reached, and 58¼ the lowest; New Jersey Central dropped from 81,774 shares to 34,092, at 52⅝@50⅞. Delaware & Hudson Canal shows a decrease of more than half compared with a week ago, at from 49 to 47⅜, closing at 48¾. The stocks sold show a falling off of 108,951 shares, and the prices have been maintained only on judicious buying.

Maryland Coal Company's stock has taken a sudden start, and advanced from 10 to 13¾, with sales of 2500 shares. It closes to-night at 15 asked.

We are in receipt of the report of the operations of the Maryland Coal Company for 1878. It shows that the company mined but 120,311 tons; whereas, from a personal inspection of its mines, we can say that it could produce three or four times as much were there a profitable market for the coal. Had the mines been driven to their full capacity, with no better prices than last year, and with all the disadvantages the company had to labor under, a very good dividend upon the present price of the stock could have been declared. With the completion of the George's Creek & Cumberland RR. and the Pennsylvania RR., we join with the President of the company in the belief that a very prosperous future lies before the company. With these independent outlets, this coal can be laid down at tide-water at prices that will meet the competition of the world, there being but very few collieries in Great Britain that can put their coal in ocean-going vessels at a lower cost. Great ability and economy are shown in the management of the affairs of this company. At the end of the year the company had a bonded indebtedness of $81,000, having decreased it $10,000 during the year. The balance-sheet shows a sound financial condition.

The Philadelphia market has suffered the same decrease in the volume of business, with the exception of Pennsylvania Railroad. Interest began toward the middle of the week, and the transactions foot up 20,043, compared with 14,059 in our last report. The prices have been strong, moving between 37⅛ and 37⅞.

Philadelphia & Reading has been quiet, at 20½@19⅞. The report, which gained some circulation, to the effect that President Gowen's trip to Europe was for the purpose of securing the foreign bondholders' approval of the lease of the New Jersey Central has been dispelled. It is announced that coal will be sent over the Bound Brook line next week.

Lehigh Valley has been very firm, and the scarcity of stock offered has the effect of strengthening holders. The financial condition of the company is excellent, and it is said that loans on four months' time at 3½ per cent have been refused by its officials. At a recent meeting in Philadelphia it was resolved, "That, out of respect for the memory of our late President, it is the opinion of this Board that it is inexpedient to appoint a President at this time, and that the Vice-President perform the duties of the office until the next election, which will not occur until the meeting of the stockholders in January next."

Lehigh Navigation has advanced from 24½ to 25¾, closing to-night at 25¼, with sales of 10,537 shares.

The New York & Straitsville Coal and Iron Co. has declared a dividend of 2 per cent on its capital stock.

The Lehigh Valley RR. Co. has declared a dividend of 1 per cent, payable on and after July 15th.

Gold and Silver Stocks.

NEW YORK, Friday Evening, June 13, 1879.

The business at the Exchanges has not been quite up to that of last week, but has been very important and well distributed.

The Bodie stocks still command great attention.

In the stock of the Bodie mine the dealings have amounted to 850 shares, at $40@$50. Ore from this mine is being crushed now, the mill having started up on Wednesday, and some remarkable returns may be expected soon. From information that we can not but consider reliable, the present strike in this mine is much more remarkable than that of last year.

This company has increased its capital stock from 50,000 to 100,000 shares, and is now known as the Bodie Consolidated Mining Company. The new stock is expected to be put on the market in a few days.

The Standard has not been quite so active, the sales amounting to but 6895 shares. The price of the stock has been somewhat weak during the transactions of the latter portion of the week, reaching $31½ on Tuesday and $29 to-day. There has been no unfavorable information from the mine.

Bechtel has been fairly active, at $2.30@$2, with sales of 1930 shares. The sales to-day amounted to but 100 shares, at $2.

In Bulwer, the sales have amounted to 595 shares, at $13¾@$12.

Consolidated Pacific continues to be quite largely dealt in, the sales for the week aggregating 5235 shares, at $7@$9⅝@$8.

Tioga records 780 shares, at $4@$4.30. There have not been any transactions during the past two days.

Belvidere has come forward with sales of 1125 shares, at $2.60@$2.35.

May Belle has had straggling transactions, amounting to 175 shares, at 70@75c.

Mono records 200 shares, at $10@$12½, and Goodshaw, 700, at $1.20@$1.

In the Comstock stocks there is no abatement of interest.

California records sales of 3295 shares, selling at $7¼ on Tuesday, and declining to $6⅝ to-day.

Consolidated Virginia has been dealt in to the extent of 6645 shares, selling at $7½ on Tuesday, and declining to $6¾ to-day.

In Gould & Curry, 50 shares sold at $12½, and in Yellow Jacket, 35, at $23. On Saturday 100 shares of Alta sold at $11½.

Consolidated Imperial has been the great feature of the week, through manipulation and a liberal distribution of "points." The sales have amounted to 45,915 shares, at $2@$3.50@$2.25. The price of $3.50 was brought about by a false dispatch from San Francisco. We are inclined to think that the public will receive similar treatment with this stock to that they received from Leviathan last year. It is of course all a gamble.

To-day 50 shares of Julia sold at $4¾.

Leviathan has had straggling transactions amounting to 1550 shares, at 85@75c.

100 shares of Bullion sold yesterday, at $10½.

The Tuscaroras have received more than usual attention.

Grand Prize records sales of 350 shares, at $4@$3.60. There have been no transactions since Wednesday.

Independence has been dealt in to the extent of 900 shares, at $3.70 down to $3 on Wednesday, but recovering to $3.25 to-day.

A business in Hussey set in on Tuesday, since when the sales have amounted to 16,500 shares, at 7@14c.

There has been a very strong demand for Navajo for several days, the sales amounting to 5750 shares, advancing in price from 35c. on Tuesday to 75c. to-day.

Tuscarora has sold from 16 to 14c., with sales of 6600 shares.

In the Black Hills stocks there has not been much business.

Homestake records sales of 960 shares, at $38½@$37@$38. From the Deadwood *Pioneer* of the 7th inst. we take the following:

"The Homestake continues to look well at all points. The deeper workings of drifts and cross-cuts are being driven in by the Ingersoll rock drills, and the work goes forward rapidly. The average of the rock now being taken out runs about the same as last month, although much richer ore is in sight in large bodies, whenever the company chooses to mill it. The mill and mine are in first-class order, and when the new 120-stamp mill is complete it will require only a few more men to break down all the ore that is needed. The machinery of the new mill is all here, and the work is being pushed forward. It is expected that by the latter part of this month it will be running. The tramway leading into the top of the mill is being built, and is the largest work of the kind in the Hills."

Caledonia is receiving increased attention, the sales amounting to 655 shares, at $4@$4.75.

In Eureka Consolidated the sales have amounted to 60 shares, at $15½@$15⅝.

Leeds sold from 80 to 90c., the transactions amounting to 125 shares.

Ontario has been quiet, the sales amounting to but 325 shares. The shipments for the first five days of this month amounted to $26,000. The reports from this mine are very encouraging.

Tip Top has attracted unusual attention, the sales amounting to 5510 shares, at $1.15@$1.60@$1.40.

There has been a liberal business in the better class of mines of the regular list of the Mining Exchange.

Findley records sales of 3800 shares, at 56@51c. The new developments and improvements are making very satisfactory progress.

Hukill has continued to attract attention, the sales amounting to 2065 shares, at $4.15@$3.80. The reports from the mine are very favorable, our advices being received from an unquestioned source.

Leadville has been dealt in to the extent of 6740 shares, at $4.05@$3.60. Our advices indicate that this mine has been much abused, and that it is likely to do more nearly what has been represented for it by its friends.

Moose has been somewhat neglected, the sales amounting to but 2910 shares at $3.20@$2.80. There were no transactions to-day.

New York & Colorado records sales of 3200 shares, at $1.40@$1.75.

Plumas has been very quiet, with sales of but 105 shares, at $3.40@$3.25. The reports from the mine are even more favorable than usual.

Cleveland records 10,260 shares, at $3.15@$3.40. Plenty of dispatches come from this mine, but nothing upon which to base an opinion.

Trio has been spasmodically dealt in to the extent of 3300 shares, at 64@65c.

The fancies of the regular list have received only moderate attention.

American Flag records 4600 shares, at 19@21c.

The dealings in Bertha & Edith amount to 50,200 shares, at 35@30c. Additional information from this mine does not tend to increase our opinion of its value.

We note sales of 24,100 shares of Buckeye, at 56@50c.

Dahlonega has been dealt in to the extent of 6500 shares, at 23@21c.

Gold Placer has ranged between 20c. and 24c. with sales of 9900 shares.

Granville records 21,400 shares, at 29@25c.

In Lacrosse the dealings have amounted to but 2800 shares, at 26@25c.

Luzerne has been active, the sales amounting to 12,300 shares, at 32@26c.

At the regular Stock Exchange we note sales of 10,440 shares of Sutro Tunnel at $4½@$4¾@$4⅜.

On Monday, 100 shares of Mariposa Preferred stock sold at $7⅛. In Common stock the transactions for the week amount to 505 shares, at $7@$5¾.

Quicksilver Common records 950 shares, at $16@$14½.

We understand that a consolidation of the Clara and Caledonia mines, of the Black Hills, has been effected, and a strong New York company will take hold of them. The papers will probably be filed in a day or two. These properties are very promising and indorsed by the highest expert authority.

We call attention to the announcement of Messrs. L. P. Bayne & Co., in another column, of the opening of the subscription-books of the Green Mountain Mining Company, at Room 10, No. 54 Broad street, and at the office of Messrs. Wilcox & Baird, No. 64 Broadway.

We are in receipt of the prospectus of the Fletcher Gold and Silver Mining Company. The list of directors is headed with the name of ex-Senator A. H. McDonald. Upon interviewing him, we find that he is unwilling to have his name associated with the enterprise. The prospectus is not a credit to the promoters. What the mine may be, only developments can determine.

Although we do not advocate large capitalizations for mining companies, yet, under the circumstances, we can not blame the companies for adopting them. The capitalization of the Little Pittsburg group of mines at Leadville, at $20,000,000, has furnished the press a text for an attack upon that company. This capitalization is merely nominal, and only represents a standard for measurement of value. The real question for consideration is the relation of the selling price of the shares to this standard.

Had the capital been placed at $200,000, divided into 200,000 shares of the par value of $1, and said shares sold at $20, or a premium of 1900 per cent, the public would receive no better nor worse bargain than under the present capitalization, with shares of the par value of $100, selling at $20 per share or at a discount of 80 per cent. Had this company been started with 100,000 shares of the par value of $100 each, it would be much more difficult to sell the shares at $40 each—a price that would be equal to the present shares at $20. A price ranging from $20 to $25 for large properties appears to meet with public favor, and promoters determine upon the price they want for their mine, and gauge their capitalization accordingly. The greatest practical objection to a large capitalization appears to be its likelihood to meet with a proportionate taxation at some time or other. We therefore say to our readers, Give no weight to capitalization, for it represents nothing; but determine whether the market price of stocks represents more or less than the actual value of the mines, and invest in or let them alone, according to the facts.

We do not approve of large capitalizations, as they tend to deceive the public and to impress it with a feeling that the mines are of much greater importance than they really are, and we regret that the Little Pittsburg Company has adopted as large a capital as it has.

Investors in mining securities should investigate more thoroughly the properties represented, and not follow too closely the manipulations on the street. Large investments are being made in the stocks of mines that have no certainty of paying dividends, and in the majority of cases these mines will never pay any thing. For the time being, the prices of these stocks may be steady, and they may advance under manipulation, but in time the manipulators will have sold out, and then the public may look for them to "sit on" the stocks they have been advising their friends to purchase, and the success of their "bear" movement will be without question, and the profits will probably be greater than on the "bull" side.

There are unquestionably mines that are highly overrated; but, owing to the absence of sufficient information to operate on, no opposition is made to the sale of the stocks. The season is now opened, and from the large number of visitors to the various mining districts, the actual facts will be made public, and we fear that the results will be very similar to the *exposé* of Moose, American, and Gold Placer last year. There is but one course to pursue. Ascertain the actual value of a mine, divide it by the number of shares issued, and act accordingly. The spirit of speculation is rapidly developing in the East, and we should not be surprised to see it at as high fever as it has been at times in San Francisco. It is not likely here, as it is there, to engulf our whole population, nor are its effects likely to be as injurious upon the whole of our commercial affairs, because the speculations will generally be with surplus funds.

The Homestake Mining Co. has declared Dividend No. 6, of 30c. per share from May earnings. It is payable at the office of Wells, Fargo & Co., on the 25th inst., the transfer-books closing on the 20th.

At last the reports of the eminent experts, Dr. R. W. Raymond and W. S. Keyes, on the Little Pittsburg group of mines have been made public. From Dr. Raymond's report we learn that the titles to the company's property are valid, and no trouble is likely to occur from intrusion underground from any existing claims. He puts down the ore reserves as follows:

In the New Discovery	$1,500,000
In the Little Pittsburg and Winnemuck	400,000
In the new ore-body in the New Discovery	1,000,000
Upon the dumps	100,000
Making a total of	$3,000,000

Of the New Discovery, he says: "Nearly four fifths of this ground is practically unworked; but I do not anticipate that the whole of this area will prove productive. Judging from present appearances, a poor zone or an interval occurs in the central part of the claim; but beyond this, at the southern end of the claim it seems likely to contain another ore-body."

Of the Winnemuck he says: "The developments in this ground indicate a probable opening of productive workings northeast of the old mine and extending toward the Dives ground, also owned by this company. The area of ground to be explored in this direction is large, and the chances of profitable discoveries are in my judgment favorable."

"That portion of the Little Chief ground claimed by this company, in virtue of the New Discovery, location and patent, contains a rich body of ore, the continuation of that now constituting the reserves in the New Discovery. The establishment of the company's claim in this case will carry with it the important right of following the New Discovery vein indefinitely beyond its side-line, according to the mining law, and will thus still further increase its ground and extend the period of profitable working.

"The cost of mining, hauling, and management is correctly stated in the prospectus, as I have satisfied myself by an examination of the books. I feel bound to say also that the work underground, the system of accounts, and the general appearance of the company's business reflect high credit upon the officials in charge."

From indications it may be safe to add for further developments 33⅓ per cent to the ore in sight, making a value of $4,000,000, or $20 per share. As there is a large amount of undeveloped ground, further discoveries may be made; but to those who invest at a price above $20, it will be a mere matter of speculation.

The report of W. S. Keyes, in most particulars, agrees with that of Dr. Raymond. He says:

"The company will be enabled to divide, from present developments, very nearly thirty months' profit, at the rate of $100,000 per month. Now, as to the prospects for the future, I may be permitted, by reason of my familiarity with this species of lode, to speak with considerable confidence. Such bonanzas as these are never isolated. They may be expected to repeat themselves within the lode. In the Eureka Consolidated they followed one another at shortly recurring intervals for a space into the earth in the direction of the dip of fully one third of a mile."

The reports quoted above are but preliminary ones. We hope to be permitted to see the full reports, and reserve further comments.

REVIEW OF THE SAN FRANCISCO MARKET.

The majority of the San Francisco quotations are lower, by which is meant the Comstocks. Outside mines, the Bodie and others, are well sustained. In the dealings in the Comstocks, the depression of the market may be the lull before the storm. The following dispatch from San Francisco to-day is significant and should the lowering of the water in any of the flooded mines lead to the uncovering of a new bonanza, we shall see, in the present temper of the mining-investing public, a renewed interest in the Comstocks, which undoubtedly will favorably compare with that of old-times Comstock inflation:

"The work in the sub-drain of the Sutro Tunnel is vigorously pushed. Although three quarters of the work is already completed, five hundred miners and carpenters are still employed. The water from the flooded mines will be discharged into the tunnel on contract time, that is to say, on the 29th instant. This time is looked forward to by the whole mining population. Since the water flooded the Savage and adjacent mines, four years ago, the lower works have remained submerged, and it was then generally believed that the top of a new bonanza had been struck. It is thought that a few weeks' pumping will free the mines of water."

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

Name of Company	Closing Quotations. June 6.	June 7.	June 9.	June 10.	June 11.	June 12.	Opening. June 13.
Alpha	29	29½	33½	31	31	29	29
Alta	10	10¼	10½	10⅜	10⅝	†9½	9½
Argenta							
Bechtel					*2½	*1.80	1.80
Belcher	5⅝	5⅞	5⅝	6¾	6¾	7	6⅜
Belle Isle							
Benton							
Best & Bel.	20	19¼	20¾	21	19½	18¾	18
BlackHawk							
Bodie	41¼	41	47	44½	44	44½	44½
Booker							
Bullion	9½	9½	11½	11	9⅞	9	11½
Bulwer					*11½	11¼	
Caledonia	2⅞	2⅞		2⅞	*3	*3½	3
California	6¾	6⅞	7	6½	6½	6⅝	6⅝
Chollar	8¾	8½	8¾	8⅝	8⅝	8½	8½
Confidence	15	15½		15¾			
Con. Imp	2	2	2⅜	2¼	2¼	2¼	2.15
Con. Pacific	6	6½	7½	8½	9	8½	9
Con. Va	6¾	6⅞	7	6⅞	6⅝	6½	6⅝
Crown P'int	5½	5⅝	5⅝	6	6	6⅝	5¾
Endowm't							
Eureka Con	17	17	16	15½	15¾	15½	
Exchequer	9½	9⅞	11⅞	10¾	10⅝	9⅝	
Goodshaw							
Gould & Cur	12½	12¼	13	12¾	12⅜	12⅛	11½
Grand Prize	4	4	3⅝	3⅜	4		
Hale & Nor.	17¾	17⅞	18½	17¾	17¼	17⅛	15¾
Hamburg							
Homestake							
Hussey							
Indep'd'nce	3¾	3½	3	3	3¾	3¼	3¼
Jackson							
Julia Con	4½	4½	4¾	5⅛	4⅞	5⅛	5
Justice	4¼	4¼	4¼	4¼	4¼	4½	4¼
Kentuck	5	5½		5			4¼
Kossuth							
Leopard							
Leviathan	¾	11-17	¾	¾	¾	¾	¾
Manhattan							
Mar. White	6½	6	6	6¼		6½	
McClinton							
Meadow Val							
Mexican	43½	43½	44½	42	41½	37⅝	37
Mono	8¾	9⅛	12	12½	11⅛	12	11
Navajo							
North. Belle	6⅝		6¾	6½	6½	6½	
Ophir	36¼	36½	37¼	35½	33¾	34	§
Orig. K'ys'e							
Overman	11	10¾	11¼	11½	11¾	11¾	
P. Sheridan							
Potosi	5⅝	5⅞	7	6½	6½	6	
Ray. & Ely	5	5	4½	4½	4⅞	5	
Richer							
Savage	16½	16½	17	16¾	15½	14¾	15
Scorpion		3¼		3¼		3	
Seg. Belcher				25	*25	*25	25
Sierra Nev.	53½	54	56½	52	50½	47¾	¶46
Silver Hill	3	2¾			*2¾	2¾	2¼
Silver King							
Standard						*31	
Summit							
Tioga					*4	*4	3¾
Tip Top						*11½	1.10
Union Con.	92	92½	97	88¾	84½	77	76
Utah	26½	25½		25	*23	*26	22½
Ward							
WashoeCon							
Yel. Jacket	20½	20½	21¾	20⅝	20½	20	19

* Opening. † Assessed $1. ‡ Assessed $2. § 32¾@34½. ¶ Assessed $3.

Addenda has been selling freely in San Francisco at $1 to 75c. per share. Sinking on the main shaft of this mine has temporarily ceased, and drifting is proceeding in both directions at the 460-foot level. It is intended to extend the drifts 100 feet each way from the shaft, and then cross-cut at both ends, which will determine the character of the lodes. It is thought that silver largely predominates in the ore of this mine.

Alpha shows a slight improvement on our last, but opens at quite a decline from the better prices of the week.

The joint Alpha-Imperial winze is now about 300 feet on the slope below the 2400 level. Face of this winze continues in quartz and porphyry.

Alta is lower, but has been fairly sustained during the business of the week. This company has levied an assessment of $1 per share. Cross-cuts in the drifts on the 1750 level of this mine, both north and south, are encountering the most encouraging indications.

The stock of the Andes Mining Company has appeared with considerable prominence, prices ranging from 40c. to $1.35 per share, later transactions being made at 90c. The cross-cut east from the top of the up-raise, and also west, continues in quartz of a promising quality and formation, particularly in the west drift.

Argenta has shown marked activity in San Francisco at improved prices. Late sales were made at $1.10 per share. This company is making shipments, the ores supplied being furnished from the east drift, 480-feet level. The average pulp assay of yellow sulphurets is $70, and of the chloride ore $42.50 per ton.

GENERAL MINING STOCKS.

Dividend Paying Mines.

NAME AND LOCATION OF COMPANY.		Feet on Vein.	Capital Stock.	SHARES. No.	Par Val	ASSESSMENTS. Total levied to date.	Date and amount per share of last.	DIVIDENDS. Total paid to date.	Last Dividend.	Rate D. An	HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE. June 7. H.	L.	June 9. H.	L.	June 10. H.	L.	June 11. H.	L.	June 12. H.	L.	June 13. H.	L.	SALES.
Alps	Nev.	800		30,000		204,000	Aug. 1878	$1 00	37,500	Apr. 1876	$0 05													
Belcher, G. S.	Nev.	1,040	10,400,000	104,000	100	1,500,200	May. 1879	1 00	15,397,200	Apr. 1876	1 00													
Bobtail, G.	Col.	2,500	1,136,630	227,326	5	*			90,630	Nov. 1878	15													
Bobtail Tunnel, G.	Col.		100,000	20,000	5	52,000	July 1873	0 30	56,000	Dec. 1878	40													
Bodie, G.	Cal.		5,000,000	50,000	100	75,000	May. 1879	1 00	800,000	Jan. 1879	1 00	40¼	40	44	41	48	47½	45		45		48	46	850
California, G. S.	Nev.	600	54,000,000	540,000	100				30,510,000	May. 1879	50	7⅛	7	7¼	7	7¼	7⅛	7	6¾	6¾	6⅝	6¾	6⅝	3,295
Calumet & Hecla, C.	Mch		2,000,000	80,000	25	1,200,000			14,250,000	May. 1879	5 00			179	178¾	179		179		178¾				52
Central, C.	Mch		500,000	20,000	25	100,000	June 1862	0 65	1,340,000	Feb. 1879	4 00													
Chollar, G. S.	Nev.	700	11,100,000	112,000	100	1,750,000	Sept. 1878	5 00	3,080,000	Feb. 1872	1 00													
Copper Falls, C.	Mch		1,000,000	20,000	50	535,000	May. 1876		100,000	Nov. 1871	1 00	2	1⅞	2		2*		2⅛	2*					2,500
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	474,600	June 1873	3 00	$1,040,000	May. 1879	50	7	6⅞	7½	7¼	7½	7¼	7¼	6⅞	6¾	6½	6¾	6⅝	6,645
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	256,320	Apr. 1878	0 50	78,000	May. 1865	8½													
Cons. Her. & Roe	Col.	16,500	1,000,000	100,000	10	*																		
Crown Point, G. S.	Nev.	600	10,000,000	100,000	100	2,073,370	June 1878	1 00	11,588,000	Jan. 1875	2 00													
Daney	Nev.	2,000		108,000		91,800	Nov. 1878	0 20	56,000	July 1863														
Eureka Cons., G. S. L.	Nev.		5,000,000	50,000	100	100,000	May. 1876	1 00	3,650,000	Apr. 1879	1 00							15½		15⅝				60
Eureka G. Mg., G.	Cal.	1,680	2,000,000	20,000	100				2,149,000	Apr. 1878	0 25													
Findley, G.	Geo.		200,000	200,000	1				8,000	May. 1879	1c			56c		51c		53c	52c	54c	52c	52c	51c	3,800
Franklin, C.	Mch		500,000	20,000	25	360,000	June 1876	5 00	585,000	Nov. 1871	1 00													
Gila	Ariz			100,000		70,000	Jan. 1879	0 25	50,000	Aug. 1875	0 25													
Gould &Curry, G. S.	Nev.	612	10,800,000	108,000	100	2,936,000	Mar. 1879	1 00	3,826,800	Oct. 1870	10 00			12½										50
Grand Prize	Nev.	1,500		100,000		100,000	July. 1878	1 00	400,000	Feb. 1878	1 00			4				3.75	3.60					350
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	3,082,000	Mar. 1879	1 00	1,598,000	Apr. 1871	5 00													
Homestake, G.	Dak		10,000,000	100,000	100				180,000	June 1879	30	38½				38		37⅛	37	37½	37¼	38		960
Hukill, G. S.	Col.	3,288	1,000,000	100,000	10	*				Dec. 1878	0 10	4.15	4	4.15		4		4.05	3.90	4	3.90	3.95	3.80	2,665
Independence	Nev.	1,500		100,000		75,000	Feb. 1878	15	150,000	Nov. 1878	25	3.70		3.50		3.36		3.25	3	3.15		3.25	3.15	900
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	300,000	Aug. 1878	1 00	1,252,000	Mar. 1870	5 00													
K. K. Cons.	Nev.			50,000		300,000	Jan. 1879	1 00	50,000	Sept. 1873	0 25													
Leadville	Col.		2,000,000			*			40,000	May. 1879	10	3.75	3.65	4.05	3.70	4.10	3.80		3.75	3.70	3.65	3.65	3.60	6,740
Leeds	Utb	3,000		60,000					78,000	Oct. 1878	0 15	80c				90c								125
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	225,000	Mar. 1879	50	162,500	Dec. 1876	0 50													
Manhattan	Nev.			50,000		50,000	Oct. 1878	1 00	400,000	Feb. 1877	1 00													
Merrimac, S.	Mas.	1,500	500,000	100,000	5	*	June		120,000	Mar.														
Minesota, C.	Mch.		1,000,000	20,000	50	436,000		1869	1 00	1,820,000	Mar. 1876	0 50												
Modoc	Cal.	4,000		100,000		480,000	Feb. 1879	0 50	50,000	Dec. 1876	0 50													
Moose	Col.	39,000	2,000,000	200,000	10	*			550,000	Mar. 1878	0 25	3.20	3			3.05	2.80	3.15	3	3.15	2.95			2,910
National, C.	Mch.		500,000	20,000	25	195,000	Oct. 1875	1 00	360,000	Oct. 1873	1 00													
N. Y. & Colorado, G.	Col.		1,000,000	50,000	20	*			20,000	Mar. 1877	0 20	1 50	1.40	1.75	1.55	1.65				1.60		1.70		3,200
Northern Belle, S.	Nev.	1,600	5,000,000	50,000	100				1,425,000	Feb. 1878	1 00													
Ontario	Uth.	3,000	10,000,000	100,000	100				2,150,000	May. 1879	50											39		325
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	3,436,800	Nov. 1878	1 00	1,394,400	Mar. 1864	4 00													
Osceola, C.	Mch.		1,000,000	40,000	25	880,000	Mar. 1876	2 00		Nov. 1878	1 00													
Pewabic, C.	Mch.		500,000	20,000	25	185,000	June 1868	3 00	460.000	July 1873	1 00													
Potosi, G. S.	Nev	700	11,000,000	112,000	100				$															
Phœnix, C.	Mch.		1,000,000	20,000	50	817,500	Sept. 1870	3 00	10,000	Dec. 1876	1 00													
Plumas	Cal.		1,000,000	100,000	10				146,000	June 1879	8	3.40										3.25		1,05
Quincy, C.	Mch.		200,000	20,000	10				2,230,000	Feb. 1878	5 00			13				13	12¾					30
Raymond & Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	800,000	Apr. 1879	1 00	3,075,000	Sept. 1873	3 00													
Ridge, C.	Mch.		500,000	20,000	25	200,000			90,000	Feb. 1875	1 00													
Rye Patch	Nev.	1,600		30,000		157,500	Dec. 1878	1 00	165,000	Dec. 1877	0 25													
St. Joseph, L.	Mo.	2,000 acs.	1,000,000	100,000	10				250,000															
Savage, G. S.	Nev.	800	11,200,000	112,000	100	4,196,500	Feb. 1879	1 00	4,460,000	June 1869	3 00													
Seaton, G. S.	Col.	1,700	500,000	50,000	10	*				May 1877	0 10													
Sierra Nevada, G. S.	Nev.	3,650	10,000,000	100,000	100	2,550,000	Apr. 1879	2 00	102,000	Jan. 1871	1 00													
Silver Islet	Mch											37½				38		37		37				262
Silver King	Ariz	1,500	10,000,000	100,000	100				450.000	Nov. 1878	0 50													
Standard	Cal.		10,000,000	100,000	100	50,000	July 1878	1 00	1,100,000	May. 1879	0 50	30¾	29	30⅛	30⅛	31½	30¾	30⅝	30½	30¾	30¾	31	29	6,895
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	4,038,000	Apr. 1879	1 00	2,184,000	Aug. 1871	2 50					23		23						35
McClinton	Cal.	1,000		60,000		60,000	May. 1878	0 25																

Non-Dividend Mines.

Allouez, C.	Mch.		1,000,000	20,000	50	940,000	May	1876	5 00																
Alpha, G. S.	Nev.	306	3,000,000	30,000	100	240,000	Mar.	1878	1 00																
Alta	Nev.	600		108,000		1,101,000	Feb.	1879	1 00																100
Am. Flag, G.	Col.	5,300	600,000	60,000	10	*																			4,600
Andes	Nev.	2,000		100,000		380,000	May.	1879	0 25																
Baltimore Cons.	Nev.	1,050		84,000		1,015,000	Apr.	1878	0 50																
Benton	Nev.	600		108,000		91,800	Dec.	1878	0 50																
Bechtel	Cal.			60,000		96,000	Apr.	1879	0 25			2.15	2	2.25	2.10	2 30	3.25	2.30	2.25	2.25		2		1,930
May Belle		1,500		100,000										75c		70c		75c						175
Belvidere	Cal.	1,500		60,000		33,000	Feb.	1879	0 20					2.50		2.55	2 50	2.50	2.40	2.60	2 45	2.35		1,125
Bertha & Edith. G.	Vir.	645 acs.	500,000	500,000	10	*						34c	31c	34c	32c	35c	31c	35c	32c	34c	30c	32c	30c	50,200
Best & Belcher, G. S.	Nev.	545	10,080,000	100,800	100	639,390	Apr.	1879	1 00															
Boyle	Nev.	600		108,000		16,240	Aug.	1878	0 15															
Buckeye	Col.		2,000,000	400,000	5	*						55c		58c	55c	55c		56c	55c	55c		55c	50c	24,100
Bullion, G. S.	Nev.	943⅓	10,000,000	100,000	100	3,102.000	May.	1879	1 00											10½				100
Bulwer												13½	13	13¾	13	13		12		12⅛	12	12		595
Cal. B. H.																4.50	4.25	4		4.50	4.25	4.75	4.50	655
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,640,000	Apr.	1879	0 50															
Cashier	Col.		500,000	250,000	2	*																		
Challenge	Nev.	90		50,000		10,000	Nov.	1878	0 20															
Cleveland, G	Col.	3,715	250,000	25,000	10	*						3.25	3.20	3.30	3.15	3.40	3.25	3.45	3.35	3.35		3.40	3.35	10,200
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	875,000	Feb.	1879	0 20			2.15	2	2.10	2	3.50	2.25	2.65	2.35	2.55	2.40	2.40	2.25	45,915
Con. N. Slope & E. T.C.	Col.	15,000	500,000	10,000	50	*																		
Con. Pacific	Cal.	1,400		60,000								6¾	6½	8¾	7	9	8⅛	9⅛	8½	9⅞	8¾	8½	8	5,235
Dahlonega	Ga.		250,000	250,000	1	*						23c	22c			23c	22c	22c	22c	21c		22c	21c	6,500
Dana, C.	Mch.		500,000	20,000	25	68,000	Jan.	1863	0 50															
Day	Nev.	1,500		100,000		70,000	Feb.	1879	0 15															
Dayton	Nev.	1,600		100,000		750,000	Apr.	1878	0 25															
De Frees	Ariz	1,500		100,000		140,000	May.	1879	15															
Duncan, S.	Ont.		1,200,000	60,000	20	75,000	July	1876	41⅔															
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	480,000	Feb.	1879	1 00									4				4		175
Gold Placer, G.	Col.		5,000,000	200,000	25							24c	21c	22c		22c	20c	24c	22c	23c	22c	23c		9,900
Goodshaw	Cal.			100,000		30,000	Apr.	1879	0 10					120		1.20	1.10	1		1				700
Granville, G.	N. C.	357 acs.	1,000,000	100,000	10	*						29c	28c	28c	27c			29c	25c	26c		26c		21,400
Humboldt, C.	Mch.		500,000	20,000	25	100,000	Sept	1878	0 15															
Hussey	Nev.	4,500		100,000		125,000	May.	1879	0 15							9c	7c	10c	9c	13c	10c	14c		16,500
International, S.	Ont.		1,200,000	60,000	20																			
Julia, G. S.	Nev.	3,000	11,000,000	110,000	100	872,500	Jan.	1879	1 25													4¾		50
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	2,868,500	May.	1879	1 00															
King's Mountain, G.	N. C.		1,200,000	120,000	10	*																		
Kossuth	Nev.	2,700		108,000		421,200	Aug.	1877	0 15															
Lacrosse	Col.	3,900	1,000,000	100,000	10	*						26c		26c				26c	25c			26c	25c	2,800
Leviathan	Nev.	2,000		100,000		265,000	Mar.	1879	25							85c		85c	75c	75c		80c	75c	1,650
Luzerne	Col.	4,200	5,000,000	500,000	10	*						32c	31c	31c	30c	29c		29c	27c	28c	27c	27c	26c	12,300
Madison, C.	Mch.		500,000	20,000	25	123,000	Sept	1876	0 10															
Mariposa preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00					7½										100
" common	Cal.	acres.	10,000,000	100,000	100	1,425,000	June	1878	1 00					7						6⅛		6¾	5¾	1565
McCracken	Ariz	4,500		100,000		100,000	Oct.	1878	0 50															
Martin White	Nev.			100,000		650,000	Dec.	1878	1 50															
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	318,200	May.	1879	1 00															
Minnietta Belle	Cal.	1,500		100,000		75,000	Apr.	1878	0 50															
Mono	Cal.	750		50,000		70,000	Mch.	1879	0 50					10		12½								200
Mt. Bross Tunnel	Col.	8,600	2,000,000	200,000	10	*		1878																
Navajo	Nev.	1,500		100,000		145,000	Feb.	1879	0 20															
New York	Nev.	1,000		100,000		80,000	Feb.	1879	0 40			40c				40c	35c	43c	40c	55c	45c	75c	60c	5,750
Orig. Keystone	Nev.	1,500	1,000,000	100,000	10	100,000	Apr.	1879	0 50															
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	3,404,280	Jan.	1879	3 00															
Petherick, C.	Mch.		500,000	20,000	100	165,533	Mar.	1876	0 50															
Pleasant View, G.	Col.	1,200	200,000	20,000	10	*																		
Quicksilver preferred.	Cal.	8,500	4,291,300	42,913	100	*																		
" common.	Cal.	acres.	5,708,700	57,087	100	*						15¾		16	15¾			15½				14⅞		950
Seg. Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	Apr.	1874	1 00															
Silver Hill, G. S.	Nev.	5,400	10,800,000	108,000	100	1,404,000	Apr.	1879	0 50															
Silver Prize	Nev.	1,500		100,000		65,000	Feb	1879	0 25															
Star, C.	Mch.		500,000	20,000	25	265,000	Mar	1876	0 50															
Superior, C.	Mch.		500,000	20,000	25	340,000	Mar	1878	0 25															
Sutro Tunnel	Nev.		20,000,000	2,000,000	10				0 50															
Tiptop	Ariz			100,000		120,000	July	1878				1.30	1.25	1.30	1.15	1.50	1.25	1.65	1.55	1.60	1.40	1.50	1.40	5,510
Tioga	Cal.	1,500		100,000		80,000	Apr.	1879	0 20			4.25	4	4		4.25		4.90	4.25					780
Trio	Col.	1,250	150,000	150,000	1									64c				65c	64c			65c	64c	3,300
Trojan	Nev.	1,500		100,000		265,000	Apr.	1879	0 25															
Tuscarora	Nev.			100,000		25,000	Mar.	1879	0 05			16c	14c	15c		15c		16c	14c			14c		6,600
Union Cons. G. S.	Nev.		10,000,000	100,000	100	660,000	Jun.	1879	2 00															
Utah	Nev.	1,000		20,000		830,000	Apr.	1879	2 50															
Ward	Nev	1,200		110,000		99,000	Jan.	1879	0 30															
Wells Fargo	Nev	1 500		108,000		243,000	Apr.	1879	0 50															

Total Assessment levied to date..... ....$66,668,413

g. Gold. s. Silver. L. Lead. c. Copper. * Non-Assessable.
Total Dividends paid to date..... ... $155,318,230

Total Shares sold duringthe week..... 297,094

Bechtel opened in San Francisco on the 11th inst. at $2½ per share. These prices have been fairly maintained throughout all the recent transactions. The ledge from the east cross-cut, south drift, 400 level, is 2½ feet wide in good ore. At one time the vein was lost, but was found after cross-cutting 32 feet east.

Belcher is steady. The cross-cut, 2560 level, 430 feet south of the incline of this mine, is in 60 feet, its face in a good-looking formation of quartz and porphyry. It has not reached the ore-vein yet, as is indicated by the fact that no water has been encountered.

Belmont has been active in San Francisco at from 40c. to 70c. per share. The ledge in this mine between the 300 and 400 level was reported to look well, and improves daily in character and quality.

Belle Isle has shown great activity in San Francisco at improved prices. Late sales were made at $1.40 per share. The different levels of this mine are improving. The vein averages 2½ feet in width of rich ore, which is composed of quartz and porphyry.

A large amount of business has been done in the stock of the Belvidere Mining Company at improved prices, though later sales were at somewhat of a decline. Work has been resumed on the various levels.

Best & Belcher opens at $18 against $20½, as in our last. The progress in the Osbiston shaft is slow on account of the strong flow of water.

Black Hawk has greatly improved in the San Francisco market. Active work is going forward in all parts of the mine with an encouraging outlook.

Bodie opens at $44½, against $38, a week ago. A recent letter from this mine says:

"The main drift on the 433 level is now nearly 180 feet in length—all in ore; the winze in the north end is down 30 feet—all in ore. The upraise is 70 feet in height—all in ore; On the 306 level, the ledge is three feet wide and clean ore making a 'back' of ore nearly 150 feet in height and 200 in length."

The dividend and assessment account of this mine stands about as follows:

Dividends.	Date.	Per Share.	Amount.
No. 1.	August, 1878	$1.00	$50,000
2.	August, extra	2.00	100,000
3.	August, extra	5.00	250,000
4.	September	3.00	150,000
5.	October	2.00	100,000
6.	November	1.00	50,000
7.	December	1.00	50,000
8.	January, 1879	1.00	50,000
	Totals	$16.00	$800,000

There have been two assessments on the stock. The first was levied in February, 1878, at the rate of 50 cents per share, amounting to $25,000. The second was levied April 22d, 1879, at the rate of $1 per share, aggregating $50,000.

The main shaft of the Booker mine is down 28 feet. It was expected to get the new machinery into running order by June 10th.

Bullion shows an improvement of $3 per share. The incline winze from the 2150 level of this mine is cutting porphyry and quartz.

Bulwer opened on the 11th inst. at $11.50 per share, which is a decline from previous prices. We note no particular change in the mine generally; the outlook is fair.

Caledonia is better. The winze below the 1600 level of this mine is making good progress. The Foreman shaft is down 700 feet.

Chollar is steady.

The north drift, 2600 level, of the Consolidated Imperial mine is averaging six feet per day toward the point where the joint Alpha winze from the 2400 level will intersect it. Every thing has been prepared, and the south drift, 2600 level, started to connect with the Crown Point, which mine will raise the water from the lower levels when this connection is made. This stock shows considerable advance during the business of the week, with the quotations well maintained throughout.

The old bonanzas are steady; active operations are going forward in all parts of these mines, and the production shows no diminution from that of some time past, the combined output amounting to some 2000 tons per week.

The main shaft of the Consolidated Pacific Mining Co. is down about 250 feet in excellent formation. The winze on ledge No. 1, 160 level, is down 43 feet. The fissure is full five feet in width, clean walls, and filled with an excellent grade of ore. The stock shows quite an advance, opening at $9 to-day, against $6 a week ago.

The main shaft of the Defiance mine is down 165 feet. This stock has been sparingly dealt in on the San Francisco market, at from $1.50 to $2 per share. Operations are temporarily suspended upon the mine until the arrival of new machinery.

The Dudley, a Bodie mine, is coming into considerable prominence on the San Francisco market, large sales having been made recently, at from $1 to $1.60 per share. Water has troubled the company considerably on the 300 level. The west cross-cut is in on the same over 400 feet. The connection between the 300 level and the Aurora Tunnel level is complete, and the showing of ore in the drift about 80 feet below the tunnel, or 160 feet from the surface, is quite satisfactory to the management. This mine shows an improved appearance throughout the various workings, and large bodies of good milling ore are encountered.

Eureka Consolidated is lower, closing yesterday at $15½, against $17¼ last week. At this price this property is selling at the rate of about three quarters of a million of dollars—surely a reasonable price, basing its valuation on its apparent producing capacity. It is said that there is ore enough in sight between the seventh and ninth levels to keep the furnaces employed for six months.

The north drift 2400 level of the Exchequer mine is in 460 feet, gradually encountering a low-grade quartz. This stock is steady.

Fourth of July, a Eureka mine, shows an advance in price, and considerable activity. The ore-body above the lower tunnel level in this mine shows considerable improvement. A contract has been let to sink a winze 100 feet below the tunnel level.

The latest sale we have of Grand Prize was on the 11th instant, when it brought $4, a slight decline from the price of the previous week. Sinking the main shaft of this mine is making good progress. The pumps are working well, and rapidly draining the mine. The lessees of the De Frees mill will commence crushing chloride ore from the Grand Prize mine as soon as they finish the supply now on hand from the Silver Prize mine. It is thought that there is a sufficient quantity of the former on hand to keep the mill running steadily for several months.

Every thing is in readiness to send the water through the 1620 connection of the Hale & Norcross mine with the Julia branch of the Sutro Tunnel. This stock is decidedly lower.

Hamburg is almost neglected in San Francisco, and the quotations unchanged. A recent letter from the mine says that the west cross-cut, 600-foot level, is now in 324 feet, face in unusually hard rock. East cross-cut 600-foot level is in 65 feet, face in much softer and more favorable vein matter. The vein of ore found near old Hamburg shaft continues to look well and is yielding some very high-grade ore. A shipment of first-class ore to the company's furnace was made on the 1st inst.

Hillside has been fairly active in San Francisco, at improved prices. The company's furnace is turning out over $16,000 in bullion per week; it is said that the mine is still improving. The 350-foot level, 220 feet of incline, still carries good ore. The 250-foot level, east from incline, is producing very fine carbonate ore.

The Independence Mining Co. is shipping regularly, getting its ore from the chloride stopes, which are yielding the usual amount. The stock is steady.

Jackson has been fairly maintained in the San Francisco dealings with no special change.

Julia shows some improvement. The temperature of the 1800 and 2000 levels of this mine has been lowered considerably since the connection between the Hale & Norcross and the Julia branch of the Sutro Tunnel.

The Waller-Defeat stopes of the Justice mine show signs of increased yield rather than of exhaustion. From 50 to 60 tons of high-grade ore are now being extracted daily. This stock is very steady.

Jupiter is coming into prominence, with dealings of some 7000 shares per week, at 75c. to $1.25 per share. Active preparations are being made for the erection of new machinery and hoisting works on this mine.

Kentuck is very irregular, closing yesterday at $6 and opening to-day at $4¼, which is quite a decline from our last.

Manhattan, in its dealings and prices, does not call for any comment. The Austin *Reveille* of May 28th notes a shipment on that day by this company of bullion valued at $12,482.09. The same authority gives publicity to the ridiculous statement that the company's operations during the year 1878 showed a loss to them of $170,000, by the reason of the difference between the value of bullion and the coin value of silver. The *Stock Report* notes a recent weekly production of the company as amounting to over $36,000. At this rate the Manhattan Company is producing nearly $2,000,000 per annum, yet the stockholders get nothing. The authority above referred to significantly observes that the more bullion the company produces the more money they lose—*in the discount*.

Martin White is almost neglected in the San Francisco dealings. Our quotations to-day show a fairly maintained position in the price of the stock. Considerable improvements are being made to this company's mill, and an additional furnace is being put in, which will enable it to increase its bullion output.

Mexican and Ophir are lower. The connection which was anticipated between the workings of the Mexican and Union Consolidated mines has not been made yet, there being a slight miscalculation in the survey. The Ophir mine is reported as looking promising, and the stopes are yielding their usual amount of rich ore.

Mono opens to-day at $11 per share as against $8⅝ a week ago. The principal interest in this mine is centered on the joint cross-cut on the Bodie line. It is now about 200 feet in length.

Navajo has shown increased activity at better prices. The ore-vein on the 250-foot level of this mine is looking well. The company has recently been running an intermediate drift south between the 70 and 150-foot levels. The vein in this drift is 14 inches wide, and ore good.

Noonday shows considerable activity in San Francisco at improved prices, late sales having been made at $3.50 per share. The combination shaft of this mine is down 90 feet, with the machinery going up rapidly. North drift, on 200-foot level, is in 216 feet from shaft, south 40 feet. The ore in the north drift is three feet in width, assaying $133. The winze in north drift is down 64 feet, with five feet of ore. The Miners' mill is at work on ore from drift and winze. The quantity of the ore extracted is now quite beyond the capacity of present milling facilities.

Overman is steady. Good progress is being made in different parts of this mine.

The stock of the Phœnix Mining Company has been sparingly dealt in in San Francisco at $2.50 to $3.50 per share. The statement is published that a very fine ore-body has been encountered in an upraise from the fifth level of this mine. It is said that there are from 4000 to 6000 tons of ore in sight which will average $60 per ton, and which will carry say 30 per cent of lead.

Potosi shows some improvement.

Savage is lower. The pipe which is to convey the water of the mine to the Sutro Tunnel is being sunk and covered to avoid the heat. The pump column above this level is being taken out. The water is about at a standstill.

The new bonanzas are lower. It is said that the outlook in both of these mines is very promising.

Work on the Silver Prize mine, a Tuscarora property, on its 200 level, has been resumed, and it is intended to commence the milling of ore at once, which will be crushed at the De Frees mill. The ore will run 40 per cent gold, and is said to average $90 per ton. This stock has been sparingly dealt in in San Francisco at 40 to 50 cents per share.

Trojan has been very active in San Francisco, at rather better prices. Late sales were made at 40 cents per share. The mine shipped $10,397 on May account, about one third of which was gold.

It is said that the Tip Top Mining Company has $16,000 in its treasury, and the local press are very much exercised that this company's stock should only bring from 70 to 80 cents per share, whereas, they observe, the mine could easily produce $2000 per day. The mine is in good order, and an excellent mill is on the property.

We note a great deal of activity in the stock of the University Mining Company in San Francisco at from 70c. to $1 per share, being an advance on the previous prices. The west cross-cut, 328 level, of this mine is in 50 feet; east cross-cut, 68 feet. The formation in both directions is of an excellent character of porphyry, with frequent seams of quartz. The drift on the west ledge is in 12 feet, the vein looking well.

Yellow Jacket is lower. The shaft is down 2577 feet.

The *Commercial Herald* of the 5th inst., says of the market:

"The mining stock transactions the past week were considerably in excess of the previous week, showing a very large influx of 'wild cats;' and why they should make such a strong presentation just now we can not comprehend, unless the possible scent of a 'boom' may be the inducement to place them in sight for the unwary to grapple whenever the good time is at hand; as it is, the 'recorded' transactions of this class are even now quite large, apparently smoothing the way for a larger field of operations. The north-end mines on the Comstock—such as Utah, Union Consolidated, Sierra Nevada—were in marked favor the past week, though an increased disposition for general investment is manifesting itself, the near approach of the completion of the Sutro Tunnel drain greatly aiding in maintaining the strength which the market has attained. The Bodie mines are obtaining a very prominent position, and the increased attention given to other districts—notably Eureka—will in all probability bring about a lively market during the balance of the current year—more so than it has been for a long time past.

"The Excelsior Water and Mining Co. will redeem $50,000 of its 10 per cent bonds on the first day of July next, upon surrender of the same, with coupons attached, and interest thereon will cease from and after that date. The numbers of the bonds for redemption were selected by lot."

San Francisco Mining Stock Sales for May, 1879.—We are indebted to the *Stock Report* of the 3d inst. for the following:

"The business transacted in mining stocks during the month of May was very large, and in many respects respects, remarkable. The figures, as compiled, are pregnant with interest and should be carefully conned by all operators in mining stocks.

Alpha	9,245	Leeds	1,790
Alta	26,345	Mary Ann	100
Andes	13,692	Mammoth	1,025
Albion	11,190	Mexican	35,630
Argenta	32,785	Martin White	1,915
Aurora Tunnel	1,590	Mackey	10,920
Addenda	790	Margarita	300
Booker	17,195	Manhattan	3,025
Black Hawk	14,880	Modoc	500
Belvidere	23,880	Mountain View	2,090
Baltimore Con	2,450	McClinton	17,900
Belcher	25,565	Mono	40,405
Belmont	4,145	Noonday	22,045
Best & Belcher	12,730	North Noonday	6,620
Bulwer	14,889	North Bonanza	38,160
Bullion	43,770	Navajo	4,605
Belle Isle	45,920	New York	11,310
Bechtel	54,557	Northern Belle	5,560
Bodie	41,492	N. Cons. Virginia	11,570
Benton	25,870	Occidental	1,535
Caledonia	13,680	Ophir	65,325
California	37,515	Overman	6,430
Challenge	14,075	Oriental	10,070
Chollar	13,440	Orient	1,850
Confidence	8,755	Potosi	18,035
Con. Virginia	71,604	Paradise Valley	3,555
Con. Imperial	109,326	Phil. Sheridan	7,330
Crown Point	24,500	Phœnix	415
Concordia	600	Peytona	1,500
Champion	11,110	Real del Monte	2,245
Con. Dorado	17,505	Raymond & Ely	4,091
Crœsus	3,600	Red Cloud	2,730
Caledonia (B. H.)	10,700	Richer	1,000
Con. Pacific	22,190	Summit	15,720
Dudley	16,350	South Bodie	14,540
Day	14,400	Syndicate	5,320
Defiance	1,025	Scorpion	26,785
Endowment	6,475	Savage	19,085
Eureka Con	3,376	Seg. Belcher	150
Exchequer	47,105	Santiago	200
Flowery	21,625	St. Louis	50
Fairfax	1,375	Senator	500
Fourth of July	10,150	Sierra Nevada	21,330
Green	1,630	Silver King	985
Gila	5,935	Silver Hill	28,125
Golden Terrace	5,000	South Bulwer	19,140
Gould & Curry	27,300	Standard	10
Grand Prize	4,605	South Standard	500
Goodshaw	12,045	Succor	10,050
Giant & Old Abe	5,705	Solid Silver	6,455
Highbridge	6,050	Star	6,950
Hillside	5,830	Silver Prize	1,050
Hale & Norcross	20,000	South Potosi	1,000
Hussey Con	4,440	Tuscarora	9,250
Hamburg	1,600	Trojan	9,315
Independence	14,640	Tip Top	5,530
Jupiter	14,675	Tioga Con	30,825
Julia	18,805	Union Con	14,826
Justice	14,390	Utah	8,940
Jackson	1,685	University	30,635
Kentuck	3,150	Vortex	11,165
Kossuth	50	Ward	23,480
Lady Bryan	24,320	Wells-Fargo	5,470
Lady Washington	8,175	Woodville	1,300
Leopard	12,295	Yellow Jacket	31,270
Leviathan	804		

Assessments, with dates when delinquent: De Frees, 15c., June 28th; Tellurium, 10c., July 5th; Oroville Gravel, 10c., June 30th; North Comstock, 5c., July 2d.

The bullion shipments from the Silver Reef, Utah, for the month of May amounted to $107,503.22.

The Hillsdale mine produced, for the week ending May 31st, $16,109.

The bullion shipments from the Bodie District from the 1st to the 31st of May inclusive have been: Standard, $120,985; Bulwer, $35,452; Noonday, $4786; total, $161,223. These figures do not include the regular monthly clean-up, which takes place about the 10th of June. The Mammoth, of Lake District, has shipped bullion valued at $9488. Compared with last year, the Bodie bullion shipments show an increase of $480,818.

Pioche bullion valued at $7328 was shipped during the week ending May 31st.

Bonanza Shipments.—Following is an official statement of the ore extraction and milling operations at the bonanza mines for the week ending May 31st, as compared with the previous week:

Virginia Consolidated:

	Previous week.	Past week.
Extracted tons	738	882
Delivered to mills	738	882
Bullion shipped to date		$71,000

California:

	Previous week.	Past week.
Extracted	1,098	1,251
Delivered to mills	1,098	1,251
Bullion shipped to date		$117,250.43

The May product of the Leadville mine amounted to $36,000.

Nine bars of bullion, valued at $9100, were shipped from the Alexander mine at Grantville, Nev., May 31st.

Fourteen thousand pounds Silver King concentrations were forwarded for San Francisco from Maricopa on May 30th.

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore, for the week ending the 13th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.	Par value.	High'st	Lowest	Closing	Sales: Shares.
American Coal Co.	$25	. . .	.....	34	100
St.L.,I.M.& S.R.Co..	100	27⅛	25	26⅝	3,780
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co..	50	.....	.....	76	20
*Penn. Salt Mf'g Co.	50	.....	.....	75	50
*Westm'land C. Co.	50	.....	.....	53	75
*Buck Mt. Coal Co..	50	.... ..	.....	40	.....
*Schuyl. Nav. Co...	50	.....	.....	.....	.....
†B.&O.RR.Co.1st pf	.....	.....	.....	110	.....
†B.&O.RR.Co.2d pf	100	.....	.....	103	.....
" " " com	90	.....	.... ..	107½	.....
†George's C'k C. Co	100	.....	. ....	55	.....
†S. Clara M'g Co...	100	.....	.....	5	.....
†Atlantic Coal Co.	10	.....	.....	50	.....

BONDS.	Princ'l. When Due.	Int'est. When Due.	Hig'st.	Lowest	Amount.
D., L. & W., 7s, conv	1891	J. & D.	105	104½	$3,000
" " " " 2d mtge.	1882	M. & S.	.....	105¾	....
N.J.C., 1st mtge. new	1890	F. & A.	116	.....	3,000
" " " 1st mtge., con	1899	Q.	94	93¼	*340,000
" " " convt.	1902	M. & N.	95	94½	*18,000
Lehigh & W. B., con	1899	Q.	95	.....	†137,000
Am. Dock & Imp. 7s	.....	J. & J.	.....	75	.....
St.L.I.M.& S..1st mt	1892	F. & A.	.....	115	....
Ches. & O., 1st mtge	1899	M. & N.	.....	.....	.....
D & H C Co., 1stm.rg	1884	J. & J.	103½	.....	3,000
" " " " " "	1891	J. & J.	104	.....	4,000
" " " " m.loan cp	1894	A. & O.	104	.....	1,000
" " " " " rg.	1894	A. & O.	.....	.....	.....
" " " " new mge.	.....	.....	.....	.....	.....
*L.V.R., 1stm.6s.cp.	1898	J. & D.	.....	114	.....
" " " rg.	1898	J. & D.	.....	113	.....
" " " 2d m. 7s, rg.	1910	M. & S.	.....	121	.....
" " " con.m.6s, rg	1823	J. & D.	105½	104⅞	48,000
" " " 6s cp.	1923	J. & D.	.....	.....	.....
*Pa.RR., 1st m.6s, cp	1880	J. & J.	105¼	.....	1,000
" " g. m., 6s, cp.	1910	J. & J.	.....	.....	.....
" " " 6s, rg.	1910	A. & O.	.....	.....	.....
" " con.m.6s, rg.	1905	Q.	.....	109	....
" " " 6s, cp.	1905	J. & D.	.....	109	.....
" " new loan, 5s	.....	.....	113	.....	6,000
*P.& R. R., 1st m.6s, R. C. 43-44	1880	J. & J.	.....	...	.....
P. & R. R., 1st m. 6s, R. C. 48-49	1880	J. & J.	.....	.....	.....
P.& R. R., 2d m. 7s cp	1893	A. & O.	.....	.....	.....
" " " scrip	1882	J. & J.	70	69	6,140
" " " in.m.7s, cp	1896	J. & D.	68	.....	20,000
" " " c.m.7s, cp.	1911	J. & D.	111½	111	12,000
" " " 7s. rg.	1911	J. & D.	.....	111½	.....
" " " cvt.7s, R.C	1893	J. & J.	66	.... .	1,000
" " C.& I.Co., Deb 7s, R. C.	1892	M. & S.	.....	.....	.....
" " & R.C.& I. Co., m. 7s, R. C.	'92-3	various	.....	.....	.....
*L. Nav.Co., 6s, rg.m.	1884	J & Q.	107¼	.....	6,200
" " RR., rg. m.	1897	F. & Q.	108	107½	700
" " cvt. co. G. R.	1894	M. & S.	.....	...	.....
" " " Gold R. C.	1897	J. & D.	103½	103⅜	17,500
" " con.m.7s, rg.	1911	J. & D.	94½	94¼	14,000
*P.& N.Y.C., 7s, R.C.	1896 / 1906	J. & D.	119	.....	5,000
*Pa Canal, 6s, cp..	1910	J. & J.	75¼	75	14,000
*Schuyl.Nav., 1st m. 6s. rg.	1897	M. & Q.	.....	100	.....
*Sus.Coal, 6s, rg...	1911	J. & J.	98½	.....	1,000
†Balt.&O. RR., 6s..	1880	J. & J.	.....	.....	.....
" " " " 6s..	1885	A. & O.	.....	.....	.....

Total transactions for the week.. ..... $661,540

* Assented. † $134,000 selling at from 68½@67⅛ per cent.

Copper and Silver Stocks.

[Reported by WILSON W. FAY & Co., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveler Building, 31 State street.]

BOSTON, Thursday Evening, June 12, 1879.

The market has been moderately active during the week, and the stocks, with the exception of Copper Falls, show a disposition to decline, owing, probably, to the renewed dullness in the ingot copper market. The public still show a desire to invest in good mining property, of which there are a few companies recently organized now placing their stock on the market; one of them, in particular, has been brought to our notice, and undoubtedly possesses real merit, under the name of the Great Basin Mining and Smelting Company, and has a capital stock of $2,500,000 divided into 100,000 shares of twenty-five dollars, and the following are the officers: President, William Reed, of Boston; Secretary and Treasurer, S. Lawrence French, also of Boston; and Manager, General P. E. Connor, of Utah. Directors: William Reed, General P. E. Connor, Frederick W. Nickerson, J. P. Bridge, and S. Lawrence French. The mine is located in Utah, forty miles from Salt Lake City, and the office is in Boston. A shaft has already been sunk, and the mine very profitably worked with the means at hand, and, judging from the men who are handling it, we should say that the venture will pay the investors, and we would suggest an investigation to parties looking about for mining investments, the stock already being rapidly placed at $2 per share.

Calumet & Hecla remains firm at 178¾@179, and sales at 179.

Copper Falls has advanced steadily and sold up to 2⅛, and closes firm at 2 1-16@2⅛.

Franklin sold at 7½ during the week, but closes quite firm at 7½@8.

Osceola is rather dull at 14¼@15⅛, and no sales.

Pewabic is also dull and weak, being offered at 2⅜, and no bid.

Quincy is weak, having sold down to 123¼, and closing at 121½@13.

Ridge has declined to 1⅝ bid and 1⅞ asked, and sales at 1 13-16, and closes steady.

Duncan is a trifle weak at 4@4⅛, and sales at 4. Some parties seem to be afraid of an approaching assessment; but from what we can learn, we should judge that there is no immediate prospect of one.

International is quite firm at 60@62½c., and sales at 60c.

Silver Islet has been quite active at 37@38, and looks as though it had about reached bottom, closing firm at 37@37½.

Sullivan, which has been quite dull, and selling slowly at about 8, took a sudden jump to-day on receipt of good news from the mine, and we have just sold 100 shares at $10, and it closes quite strong.

Altar is steady at 75c.@$1, and sales at 75c.

Commonwealth is weak at 25@35c.

May Copper Products.—The *Mining Gazette* of June 5th reports the following:

The mines that make a monthly statement of their yield have sent in the following figures representing their products for the month of May:

	Tons.	Pounds.
Calumet & Hecla	1,354	110
Osceola	152	710
Franklin	141	330
Atlantic	136	670
Quincy	130	480
Allouez Tribute	100	485
Pewabic	20	1,750

Gas Stocks.

NEW YORK, Friday Evening, June 13, 1879.

There is nothing new to report in stocks, the market being very dull. Brooklyn stocks are rather demoralized and very hard to sell, even at low figures. New York stocks may be considered a little firmer, and not pressing for sale. New York has gone up 12 per cent; Manhattan has declined from 175 to 170; and Metropolitan, Brooklyn, from 45 to 40, bid; Municipal, New York, bonds are a trifle stronger.

The Electric Light.—Under congressional appropriations for lighting the Capitol building, three electric generators have been purchased, and a fourth will probably be acquired for the purpose of supplying the dome with an outside light. The steam power used for heating and ventilating is available for running a dynamo-electric machine. The Société Générale de l'Electricité, of Paris, has declared a dividend for the nine months at the rate of 16½ per cent per annum, and its report, which is a hopeful one, directly conflicts with statements apparently authoritatively made as to the greater cost of the electric light as compared with gas. The discrepancy, however, may be explained by the fact that in the cost of gas the price charged by the city, which derives a revenue from this source, is put down, and not the prime cost.

AUCTION SALES.

Metropolitan Gas-Light Co.—6 shares at 128 per share, also $240 scrip, at 102½ per cent.

New York Gas-Light Co.—109 shares, at 97¼ per share.

Manhattan Gas-Light Co.—100 shares, at 170 per share.

Boston Gas Co.—1 share, $75 2½ per share.

The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	DIVIDENDS. Am. of last.	DIVIDENDS. Date of last.	QUOTATI'NS Bid.	QUOTATI'NS As'd.
	$		P. ct.				
Mutual, N. Y....	5,000,000	$100	6	1½	Apr., '79	70	75
" Bonds...	90,000	1,000	6	3½	Feb., '79	101	104
N. York "	4,000,000	.....	8	4	May, '79	97½	100
Metrop. "	2,500,000	100	10	5	Feb., '79	122	127
" Certfs...	1,000,000	.....	7	3½	Feb., '79	101	104
Harlem "	1,850,000	50	6	3	Feb., '78	40	50
Manhat. "	4,000,000	50	.....‡	5	June, '79	170	180
Brooklyn, Bkln.	2,000,000	50	15	5	May, '79	120	127
Nassau	1,000,000	25	.....‡	3	Jan., '79	55	60
" Certfs...	700,000	1,000	7	3½	May, '79	80	87
People's.....	1,000,000	10	....‡	3½	Jan., '76	18	22
" Certfs.....	300,000	1,000	7	3½	Jan., '79	70	75
" Bonds....	300,000	.....	7	3½	May, '79	90	96½
Metrop. "	1,000,000	100	5	2½	May, '79	40	50
W'msb'g "	1,000,000	50	8	1½	Apr., '79	70	80
" Certfs...	1,000,000	.....	7	3½	Jan., '79	85	92
Citizens'.....	1,200.000	20	....‡	3	Jan., '79	55	65
" Bonds...	315,000	1,000	.....	3½	Apr., '79	95	100
J. C., N. J.....	750,000	20	10	7½	Jan., '79	135	145
Municipal, N. Y.	2,000,000	100	12	3	June, '79	115	120
" Bonds..	750,000	100	7	3	May, '79	104	108

DIVIDENDS.

OFFICE OF THE HOMESTAKE MINING COMPANY, No. 31 BROAD STREET, NEW YORK, June 12, 1879.

DIVIDEND NO. 6.

The regular monthly dividend of THIRTY CENTS per share has been declared for MAY payable at the office of the Transfer Agents, WELLS, FARGO & CO., 65 Broadway, on the 25th inst. Transfer-Books close on the 20th inst. H. B. PARSONS, Assistant Secretary.

"STEELINE" Used for Refining and tempering of Steel and Tools. Send for circular to BAUER & CO., 96 Greenwich Avenue, New York.

FINANCIAL.

W. W. HANLY & CO., BANKERS AND BROKERS, 60 Broadway, New York,
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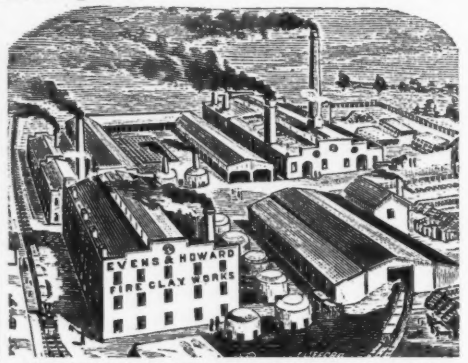

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